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NEWSPAPER

# COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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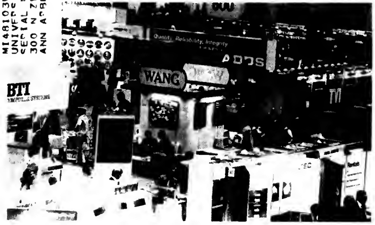


CW Photo by R. Frank

**This was the scene on the show floor as Interface West opened in Los Angeles last week. Conference coverage continues on Pages 4 and 5.**

## Not Only DPers Guilty Of DP Crime, Expert Warns

**By Ronald A. Frank**
CW Staff

LOS ANGELES — Computer crime is not the exclusive domain of DP experts, many computer crimes are committed by those who don't know a thing about DP operations, according to Jay J. Becker, director of the National Crime Data Center in the Los Angeles district attorney's office

In fact, it is not necessary for a person to have access to a DP system in order to compromise it, Becker warned at a session of the Interface West conference here last week

Because computer crime can originate beyond the boundaries of the DP room, he advised users to pay attention to all facets of a DP operation for potential trouble areas

It is unfortunate that so much attention is given to computer crime because it implies computerized systems have more of a tendency to be compromised than manual systems, Becker observed, pointing out that there is no hard data to substantiate this premise. It has not been demonstrated that the likelihood of loss is greater with automated systems than with nonautomated systems.

The implementation of a computerized system actually provides the user with the capability to guard against unauthorized loss In order to achieve this capability, however, the user must anticipate areas where the system is vulnerable. These should include the related areas of telecommunications, personnel and security procedures, Becker said

### Little Sophistication Needed

Some computer crimes are being committed by people with a kindergarten-level of CPU sophistication, Becker said In one instance an equipment operator printed duplicate paychecks for himself simply by pushing the repeat button on a high-speed printer.

Although examples of this type sound comical, they can cost corporations thousands of dollars, Becker

*(Continued on Page 2)*

## Xerox Plans to Offer Network Combining Satellite, Radio Links

**By Jake Kirchner**
CW Washington Bureau

WASHINGTON D.C. — Xerox Corp. announced plans last week for a domestic digital communications network that will use a combination of satellite and radio lines.

The communications system — Xerox Telecommunications Network (Xten) — will be offered by a Xerox subsidiary which would be established if the plan is approved

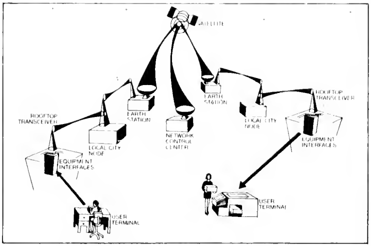
Xerox filed a Petition for Rulemaking with the Federal Communications Commission (FCC) Thursday requesting that a band of radio frequencies be allocated for common carrier electronic message services providing information transmission Xten would use a portion of the requested band — in the 10GHz range, according to Xerox.

The use of radio links for local communications makes the system unique, sources indicated The proposal for Satellite Business Systems (SBS), in which IBM is a partner, imagines direct communications through a satellite from one company location to another.

Xten, however, will use the radio links for local distribution while the satellite communications are handled by the city nodes.

At present there are no radio bandwidths allocated to this type of

*(Continued on Page 6)*



**The Proposed Xerox Telecommunications Network**

## Lack of Women DPers Seen 'Severe Loss'

**By Marcy Rosenberg**
CW Staff

WASHINGTON, D.C. — The paucity of professional women working in the computer science, general science and engineering fields "represents a severe loss of scientific talent," according to Joan Callanan, manager of the National Science Foundation (NSF) Women in Science Program, which is trying to attract more women into these professions.

The most recent nationwide NSF survey showed that in the computer science area, the number of men employed at or above the systems analyst level far outpaced the number of women.

Seventeen surveys were sent to all graduates from 1970 and onward who received science and engineering degrees. These included 60,000 Ph.Ds. 50,000 in the 1970 labor force plus new entrants for each year up to 1975, and 7,000 graduates each for 1974 and 1975.

The 1976 results indicated that through 1975, 138,700 men vs. 33,600 women were working as systems analysts or in higher DP positions. This showed little change from the previous survey year, which showed 134,900 men and 31,300 women actively employed in those job categories through 1973

In addition, the most current national figures from the National Center for Education Statistics, published in the July-August 1978 *Scientific Technical Manpower Comments*, showed that as of 1976, more men were studying computer science at all degree levels.

The breakdown for total numbers of degrees conferred in computer and information sciences from 1970-1976 showed that out of 25.555 B.S. degrees, 16 8% went to women. Women received 12.6% of the 12,856 M S. degrees and were granted 6.6% of the 1,146 Ph.Ds awarded

*(Continued on Page 8)*

## *Unfair Competition?*

**By Ronald A. Frank**
CW Staff

STAMFORD, Conn. — Can an automated terminal provide unfair competition to humans? That is the issue raised in a suit filed by the First Stamford Bank and Trust Co. against four local banks that operate automated teller machines (ATM)

The ATMs provide banking services to customers seven days a week Norman Reader, president of First Stamford, thinks the seventh day constitutes unfair competition for his bank

The origin of Reader's complaint is a Sunday closing law, passed by the Connecticut Legislature in its last session, that prohibits banks from operating on Sundays

First Stamford has no ATMs, so Reader believes his bank is at a disadvantage. Under the law, it cannot hire tellers to serve customers on

*(Continued on Page 4)*

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## *Man Held Overnight*

# Old File Blamed for Near-Arrest

**By Tim Scannell**
CW Staff

TEMPE, Ariz. — A Nevada businessman recently stopped by police here for a traffic violation was nearly charged with out-of-state grand theft because of outdated information in the National Crime Information Center's (NCIC) computer.

James Culverwell was detained by local police about three weeks ago for failing to dim his automobile headlights. He was subsequently arrested and charged for another "minor" violation, according to a police spokesman.

When the Tempe police delivered their suspect to the station, a routine check with the NCIC network revealed a warrant had been issued for Culverwell and he was wanted in Stockton, Calif., for grand theft. Culverwell, however, maintained the computer was wrong and he was innocent.

Culverwell spent the night in the Tempe jail and was transferred the next morning to the Maricopa County Sheriff's Office, which handles all felonies and extraditions. He was released about 11 p.m. that night, after it was discovered that the computerized record detailing his warrant was not only wrong, but more than six months old, according to Steve Rempe, Culverwell's lawyer.

"The Tempe police just technically followed what was in the computer," Rempe explained. "They haven't been sued enough where it's gotten to the pocketbook of the city . . . so they generally rely on the word of the computer rather than the guy they're arresting."

Culverwell's NCIC file originated earlier this year, when a man in California filed theft charges against him following the repossession of a trailer purchased from Culverwell's company, Rempe said. The charges were dismissed in court, but the incident was apparently never purged from the NCIC data base.

### System Defended

According to Harry Balian, a detective with Maricopa County's Fugitive Division, the police department that issued the original warrant has the responsibility of purging it from NCIC files. "As soon as we found out there was some sort of mix-up, naturally, we let Culverwell out of custody," Balian stated.

Although Rempe believes the NCIC system has more than its share of mistaken "hits," Balian, who works directly with the computerized files, thinks the system is basically good. "But every once in a while something [wrong] will occur," he admitted.

Maricopa County police officers have to operate within a strict set of guidelines and every arrest is carefully scrutinized for errors. "Nobody needs false arrest suits because all they're doing is costing the taxpayers money when that money can go to something useful," Balian pointed out.

The only problem with the system, he said, is that some police departments enter warrants and then refuse to extradite the wanted person once he is caught because of the cost involved in transferring a prisoner from one state to another. "Usually a state will reduce the charge to 'in-state-only' pick-up and avoid the extradition process," Balian said.

# All DP Criminals Not DPers

*(Continued from Page 1)*

noted. He cited schemes in which accounts were rounded to deduct five cents, and the perpetrators amassed huge amounts without attracting much attention to any single account.

In one case, a bank depositor had deposit slips imprinted with a microcode of his account, then placed them at the customer desks. Unwary depositors filled out deposit authorizations that channeled their money into the culprit's account. This was done with valid signatures from each depositor.

The implementation of distributed DP concepts provide the user with an opportunity to take a close look at existing systems "to see where holes can be plugged up," Becker said. Users should ask themselves, "What if someone wants to steal from the system?" then anticipate how it could be done.

Until now perpetrators of computer crimes have compiled a fairly dismal record of light sentences. The National Computer Crime Data Center is meant to be a place where investigators and law enforcement agencies can get data on the methods involved in these crimes, Becker explained. With wider dissemination of computer crime information, it is hoped the odds will change and more convictions for these crimes will result, Becker said.

Many of these crimes presently go unreported, and the center may make it easier for companies to identify how crime has been committed.

Computer crime is still in its early stages, Becker said, identifying as new areas the international arena and the tampering of automated accounts.

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# LANDSLIDE

## The results are already in for the Great Sorting Election of 1978!

**(54% vote for Syncsort OS, only 36% for IBM 's "top" sort.)**

## Call (201) 568-9700.

**Ask for a copy of the latest "sort census."**

*Ah, we can almost see and hear it now! It is Election Night, and there is Good Old Reliable Walter, sitting exactly where you'd expect him to be—at the anchor desk in Election Headquarters. Suddenly he fiddles with that thing he wears in his ear, listens intently and says:*

*"Ladies and Gentlemen, we now have a winner in that OS sort-program race that has aroused so much interest across the nation. We predict that SyncSort will be re-elected handily with an impressive 54% of the vote.*

*"Trailing badly is the handpicked candidate of the powerful IBM Machine—SM1-5740, Release 3. Despite the fact the other IBM entries—SM1-5734 and SMO23—threw their weight behind Release 3, IBM's top-of-the-ticket candidate garnered only 36% of the vote.*

*"Will this be the last hurrah for that silver-haired, florid-faced sort known in so many of the nation's club houses as 'ICEMAN 3?' To find out, we take you now to the losing candidate's headquarters in beautiful downtown Armonk…"*

Sorry, Walter, but we've known about these results for weeks now. Because this year, as in 1977, we commissioned those redoubtable poll-takers, the International Data Corporation, to find out for us.

They conducted a telephone survey to find out who uses what sort. The results—together with those for last year—are shown below:

**SORTS USED BY OS & OS/VS USERS IN THE UNITED STATES**

| Sort Name | July 1, 1977 No. of Systems | July 1, 1977 % | July 1, 1978 No. of Systems | July 1, 1978 % |
|---|---|---|---|---|
| **SyncSort** | 1,333 | 43% | 1,836 | 54% |
| **SM1-5740 (IBM)** | 992 | 32 | 1,224 | 36 |
| **SM1-5734/SM023 (IBM)** | 651 | 21 | 204 | 6 |
| **Other** | 124 | 4 | 136 | 4 |
| | 3,100 | 100% | 3,400 | 100% |

If you'll call, we'll be glad to send you a copy of the full report. It contains some interesting information on how data processors migrate from those venerable old IBM graybeards —SM1-5734 and SMO23—to SM1-5740, Release 3 and, eventually, to SyncSort.

The reason is not hard to find. Data processors are becoming increasingly aware of inflated "sorting taxes"—overuse of CPU Time, Elapsed Time and the other valuable computer resources that go into sorting. Show them a sort that does more work for fewer resources, and they'll vote for it.

Quicker than you can say "Proposition 13."

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# Communications Seen Tying Corporate Tasks

By Ronald A. Frank
CW Staff

LOS ANGELES — Telecommunications is pulling together operations that are now separate within the average company, according to William C. Brasuell, manager of worldwide telecommunications at Fairchild Camera & Instrument Co.

Speaking at a session on emerging technologies at the Interface West Conference here last week, Brasuell said telecommunications is a weapon in a company's arsenal and is becoming a tool for many firms to combine communications and information transfer needs.

Telecommunications can be broken down according to existing technologies, merging technologies and emerging technologies, and things are moving very fast with continuing equipment improvements, he told attendees.

### Self-Contained Functions

Existing technologies include operations which now are primarily self-contained functions within the business environment. These include TWX/telex, store-and-forward message-switching, facsimile, copying, optical character recognition (OCR), word processing, calculator, minicomputer and voice functions.

The first attempts at consolidating these functions have included the addition of communications capabilities to word processing systems; the combination of TWX/Telex, private line and dial up facilities into one terminal; and the computer based PBXs. In the latter category Brasuell included systems from Danyray, Northern Telecom Ltd. and Rolm Corp. and the Dimension series from Bell.

Thus far functions have been combined in equipment that is being utilized for multiple operations. But the real promise lies ahead; in the area of emerging technologies, Brasuell said.

One device that will be avaialble in the future is the total office unit, which will include distributed processing, data input and inquiry, word processing, TWX/Telex and mainframe computing operations, Brasuell predicted.

There will also be high-speed 5- to 10 sec facsimile devides with store-and-forward capabilities. Units are already available that will digitize an average page into 50K bits, and at 9,600 bit/sec this information can be transmitted at the rate of about 5 sec/page.

## CW at Interface

Even at the slower, more common dial-up speed of 4,800 bit/sec, a page can be transmitted in 10 sec, he explained.

### Communications for Copiers

Communications capabilities will be added to copiers so duplicated information can be transmitted immediately, Brasuell forecast. This may lead to some combination of the copying and facsimile functions.

Total PBX switches are on the way that will do much more than handle traffic as it occurs. Typical of this trend, he noted, is the feature introduced by Danray that allows messages to be stored and called up when a person is ready to receive the information.

Store-and-forward facsimile machines will be introduced by 1979 and these will eventually communicate directly with mainframes in the DP center, Brasuell predicted.

It is important to enable communicating word processors to transmit with standard communications routines and protocols so they can interact with other communications systems. Until now many of these systems have been unnecessarily hampered by nonstandard protocols that limit their flexibility, he said.

It will become possible to store a document on a mainframe instead of restricting it to the word processing environment, Brasuell said. Some companies now use their CPUs to print documents prepared on word processing systems.

When this link is implemented, it is possible to print information at 12,000 line/min on a CPU output printer instead of having to live with the 30 char./sec capability of the word processing system.

### Upward Pressure

As these functions merge, Brasuell said, upward pressure on corporate communications costs will be created. If properly managed, these costs will rise in a controlled manner.

The benefits of the combined functions should be evaluated by considering what other operations will be eliminated, he suggested. Some combined operations will limit the amount of travel that is now required or inventories may be reduced when faster recordkeeping is instituted.

One problem faced by companies which combine their telecommunications is determining who will manage the operations. Companies have not yet decided where to put this responsibility, but it tends "to collect under management information systems departments," he observed.

DP personnel are taking over this area because they seem to be closer to the technologies, but this pattern is by no means established.

In any case, telecommunications is a valuable corporate resource that must be managed in the right balance, and firms should get enough facilities to adequately perform the functions that are needed. Regardless of who ultimately manages the emerging operations, this area will take on increasing importance within most companies, Brasuell concluded.

# Suit Asks Whether ATMs Offer Unfair Competition

(Continued from Page 1)

Sunday, but other banks can provide service by means of the ATMs.

In filing suit against four large banks, Reader is not asking for damages; he said he merely wants the machines to obey the same laws with which humans must comply. In order for the ATMs to operate on Sunday, Reader believes, people must be working at the defendants banks' at DP centers or be available in case the machines malfunction.

Both of these job types violate the Sunday closing law; more importantly, however, they allow his competitors to operate while he must keep his human tellers home, Reader said.

First Stamford had been operating one of its branches for three hours on Sunday mornings with good customer response. When the Sunday closing law took effect Oct. 1, these operations had to be suspended.

### Injunction Sought

"We are seeking a temporary injunction against the other banks" to keep them from operating on Sunday, according to First Stamford attorney Joseph Zone. A permanent injunction will be sought to prohibit any Sunday operations until the main issue in the case is resolved, he added.

While the suit was filed against four specific banks as a practical matter, an injunction by the Fairfield County Superior Court would close all banks on Sundays. It is unlikely that a bank not named in the suit would attempt to operate if an injunction were issued, Zone said.

Asked if changing the Sunday closing law to exempt banks would be a possible solution, both Zone and Reader agreed this would take the anti-competitive aspects out of the situation. Thus far, however, Reader has taken no steps to ask for such an amendment.

### ATMs Not Personalized

First Stamford does not have ATMs because human tellers can provide more personalized service, Reader said. One of the smaller banks in the Stamford area, it cannot install ATMs on a large scale like some of its competitors, according to Zone.

The charges and request for an injunction will be heard today in Stamford. An attorney representing the defendant banks said last week he had not yet met with his clients to form a position regarding the First Stamford suit.

Named as defendants were the Hartford National Bank, Union Trust Co., State National Bank & Trust of Stamford and Connecticut National Bank of Bridgeport.

### None in Operation

A spokesman at Hartford National, attorney Ray Guenter, said his bank had not operated ATMs in the area since early this year and he believes Hartford National will be separated from the suit. "We only had one [ATM] and that has been out of operation since February," he said.

A spokeswoman at Union Trust said that bank would have no comment on the suit "until our lawyers look at it."

One banking source said the suit appears to be aimed at clarifying the Sunday closing law as it relates to banks, rather than raising issues relating to machines vs. humans.

Banks that operate teller terminals generally find that weekends are heavy use times, when customers caught short of cash make use of the ATMs. A legal ruling that prohibits all Sunday ATM operations might be interpreted as causing a hardship for such customers, according to one legal source.

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## *Show Sees Few Introductions*

# Dataspeed Upgrades, Fiber Optics Highlighted

**By Ronald A. Frank**
CW Staff

LOS ANGELES — Upgrades to AT&T's Dataspeed 40 terminal series and fiber-optic digital data links for local-loop applications highlighted the product introductions as the second annual Interface West conference opened here last week.

The products were among the few introductions made by the 101 exhibitors which occupied 180 booths at the show, attracting about 6,000 people during its three-day run.

Canoga Data Systems of Canoga Park, Calif. introduced its CRS-100 digital data link, which is RS-232-compatible and can handle speeds up to 56K bit/sec. The unit was demonstrated transmitting a message at 9,600 bit/sec from a Heath Co. microcomputer to a CRT over a one kilometer spool of fiber-optic cable.

The CRS-100 costs $625 for a standalone version; rack-mounted versions are also available. A unit is required at each end of a point-to-point asynchronous data link.

Valtec Corp. demonstrated a similar link that transmitted data between two CRTs. The RSK-D1 link operated at 9,600 bit/sec in full-duplex mode. The RS-232-compatible device is priced at $600 from the W. Boylston, Mass., vendor.

### Three Dataspeed Additions

The AT&T booth featured three additions to the Dataspeed 40 terminals series - a dial-up, single-station version of the Dataspeed 40/4 CRT, a receive-only printer for synchronous applications and a forms access printer.

The dial-up version of the 40/4 can operate at 1,200-, 2,400- or 4,800 bit/sec using Ascii or Ebcdic code. It will be provided for about $180/mo with an estimated one-time installation charge of $235.

The terminal was demonstrated operating on-line to an IBM 370/168 mainframe running under CICS at the AT&T corporate computer center in Piscataway, N.J.

### Receive-Only Printer

The receive-only printer was designed for remote batch applications using point-to-point dial-up or private-line facilities. It is compatible with Dataspeed systems operating at speeds up to 7,200 bit/sec and can operate with systems using IBM 3770, 2780, 3770 and 3780 binary synchronous protocols, AT&T said.

The unit will be priced at about $225/mo with a $190 installation fee for an 80-column version and at about $265/mo with a $220 installation fee for a 132-column model.

The forms access printer generates tickets, receipts and policies utilizing a tractor-feed mechanism. It operates at 300 line/min and handles multipart forms. The unit will cost about $160/mo with a $165 installation fee.

Initial tariffs for the three Dataspeed devices will be filed in the first quarter of 1979, AT&T said.

### HP Emulator

Hewlett-Packard Co. introduced an asynchronous terminal emulator software package that allows its System 45 desktop CPU series to transmit data to larger mainframes. With the emulator, the HP 9835 and 9845 act like a teletypewriter operating in interactive mode with a mainframe.

The emulator package includes three programs written in Basic and a binary program which operates with the I/O read-only memory in the desktop systems. The software costs $300.

Using the terminal emulator package, the 9835 and 9845 CPUs have been interfaced to the Digital Equipment Corp. Decsystem-10 and the HP System 1000 and System 3000. The software will operate with any asynchronous CPU, according to an HP spokesman.

RCA Service Co. added a CRT to its Zentec terminal line. The terminal offers microprocessor control and a 1,920-character CRT screen capacity.

**CW at Interface**

The terminal has dual I/O ports and can accept downline loading of programs from a host CPU.

The unit will be priced at about $115/mo with service, a spokesman said.

Disc/310 Corp., a systems house specializing in Data General Corp. and DEC software, introduced a data base management system (DBMS) that is said to allow users to dynamically create and modify files, screen formats, menus and output reports without changing applications programs.

The DBMS was designed for material requirements planning, production control, engineering change orders and similar applications. The turnkey price for implementation of the system on DG hardware ranges from $50,000 to $500,000 depending on features. Disc/310 is located in Santa Monica, Calif.

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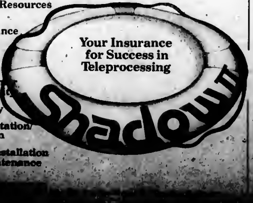
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# Six Months Later, College's Boards Still Missing

**By Don Leavitt**
CW Staff

NEW YORK — Data processing at Herbert H. Lehman College ground to a halt last spring when vandals made off with many of the printed circuit boards from inside the school's IBM 360/40, its control units and peripherals [CW, May 15].

Despite pleas made through *Computerworld* and other publications, none of the boards have been recovered. The two detectives who were working on the case in the spring have been reassigned to other duties and the case, while not officially closed, is no longer being actively worked on.

The old system is dead; it would have cost too much to try to restore all the missing boards from the essentially obsolete equipment, according to Lehman's DP manager, Susan Kliavkoff.

The college's data center, however, is far from dead. Lehman limped by for a while by working at a backup site, then got back in full stride after officials at the central computer installation for the City University of New York — of which Lehman is a part — found a "very similar" machine already owned by the city but considered surplus.

The "new old system" was moved into the college's data center — in a single-story building near campus police headquarters — and operations are back to normal. Security "has been reevaluated and improved," Kliavkoff said, although she was unwilling to go into details on the improvements.

Kliavkoff had been both concerned and upset by the break-in and destruction of the 360/40: "You read about things like this happening, but it's always to someone else. And then, then it happens to you. With no apparent motive."

### Overwhelming Response

But she was much happier talking about the aftermath. The initial backup operation worked quite well, though not as conveniently as having the equipment right on campus.

It was the responses — phone calls and letters — she got after the story was published that really got to her. "They were marvelous — so many from [CW's] readers and not all from near here. Offers to help if they could or just to let us know they cared. It was truly heartwarming," she said.

Meanwhile, the case is still open at the Bronx Burglary Squad. Det. Donald MacNaulty, who originally alerted CW to the situation, is still nominally in charge of the case, but he has been transferred to a homicide unit. Det. William Larkin, who worked with MacNaulty, has also been shifted to what one of his fellow officers described simply as a "sex squad."

Neither MacNaulty nor Larkin were available for comment, but a spokesman for the burglary squad said he "remembered" the case and that if any phone calls came in about it, they would be referred to MacNaulty.

# Net to Combine Satellites, Radio Links

*(Continued from Page 1)*

service, Xerox said. That is why the firm has asked the FCC for a ruling on this part of the proposal before it files detailed tariffs or plans for the service.

The planned network will eventually be nationwide, employing "leased satellite capacity integrated with unique customer radio lines." Xten will permit the transmission not only of computer-to-computer digital information but, because of the wide bandwidth, "high-quality graphic information as well," the company said.

Transmission rates will range up to 250K bit/sec, Xerox said, but added it had not yet chosen a supplier from which to lease its satellite circuits.

Depending on the FCC approval process, the Xerox service could be initiated in selected U.S. cities by late 1981, the firm said, and eventually be extended to some 200 metropolitan areas.

Xerox predicted the full 200-city system could be up and running five to seven years after first operations begin.

Xerox said its planned network is directed at three categories of business communications: Document distribution, data transmission and teleconferencing.

According to Xerox's plan, the service will provide terminal compatibility and data encryption functions at the user locations. Transceivers will be located on the user premises, linked to rooftop antennae. From there signals will be transmitted by radio link to a network "subnode."

The subnodes will serve as repeater links between user sites and city nodes located in major metropolitan areas where computers would execute store-and-forward, priority control, multiple address, delivery acknowledgment and other systems functions. The outgoing message would proceed from the city nodes to satellite earth stations.

The network will use leased satellite transponders to complete the connections among the 200 metropolitan areas the final system will encompass, according to the Xerox blueprint.

In differentiating the system from the planned SBS system, Xerox said the SBS offering is aimed mainly at the very largest companies in the nation, which could afford rooftop antennae for satellite communications at all their locations.

The cheaper antennae and ancillary equipment for the planned Xten offering, it indicated, will be aimed at the large number of medium-sized firms which cannot afford the SBS-type of service.

Xerox said it has targeted as potential users the 823 companies in the U.S. that operate from more than three locations.

The plan also calls for two network control centers which, besides performing monitoring and control functions, will store messages for subsequent retrieval by Xten customers.

The primary benefit to the consumer, Xerox said, will be in low operating costs resulting from "the unique use of radio links to eliminate the costly delays and quality loss resulting from routine data over voice telephone circuits or the even more costly alternative of installing individual earth stations or private cable circuits to handle data."

Each of the major earth stations will have either 5- or 10-meter antennae costing between $300,000 and $500,000, according to William Combs, vice-president for marketing for Xten services.

Altogether, he predicted, these stations, with all their associated computer and ancillary equipment, will cost "upward of a couple of million dollars each."

The rooftop antennae, however, will be priced only in the "thousands of dollars range," he said, adding that they will be designed for very low power consumption and be fully solid-state.

Even though the service has been in the planning stage for "well over a year now," no proposed cost figures for typical applications were available from Xerox last week.

The service is a "normal extension of our business products," Combs said. "The office of the future is going to have a lot more communications."

He predicted that manufacturers will develop a completely new line of document processors to take advantage of this type of service.

# Service Details Ongoing Studies

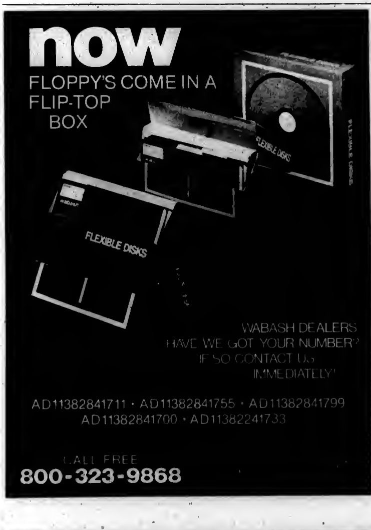
WASHINGTON, D.C. — Want the latest facts on ongoing research projects in areas like the behavioral sciences, earth sciences, chemistry or electronics?

The Smithsonian Science Information Exchange (SSIE) is offering to keep you up to date on such things through its computerized file containing descriptions of over 200,000 ongoing and recently completed projects in all fields of basic and applied research.

Information comes in the form of a "Notice of Research Projects" (NRP) — a one-page project description that also discusses project plans for the coming year.

The cost of the NRPs depends on how many are contained in a package, with prices starting at $35 for a package of 10 to 25.

A complete list of the packages is available from SSIE, Room 30, 1730 M St. N.W., Washington, D.C. 20036.



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## *Fears Data Won't Be Guarded*

# Credit Reporter Files to Quash FTC Subpoena

**By Tim Scannell**
CW Staff

DALLAS — The Chilton Corp., one of the nation's leading consumer credit reporting firms, has filed a motion to quash or limit a subpoena recently served by the Federal Trade Commission (FTC) as part of a major investigation into the computerized credit reporting industry.

The subpoena, served earlier this year, calls for the release of virtually every document and computer program in Chilton's automated system — including proprietary trade data — with no assurances of confidentiality, according to James Sutton, the firm's secretary and corporate counsel.

Compliance with the FTC order would not only jeopardize Chilton's competetive edge in the industry, Sutton claimed, but would also place an "oppressive burden" on the firm's employees, who would be required to gather the subpoenaed data.

The FTC initiated an investigation in late 1976 to determine whether credit reporting firms were complying with the Fair Credit Reporting Act and taking reasonable procedures to ensure the accuracy of their files. The "nonpublic" study originally involved just TRW Credit Data [CW, Sept. 13, 1976], but was recently expanded to include the Chilton Corp. as well as Associated Credit Services, Inc., Credit Bureau, Inc. and Trans Union Systems Corp.

### No Acceptable Security

Chilton Corp., which processes an average 16 million credit files per year, has been negotiating with FTC officials since July to reduce the subpoena's extent to a "reasonable level," Sutton said. The firm has also asked the FTC to establish standards of confidentiality to protect the proprietary nature of the records and programs.

However, the commission has failed to institute any "acceptable" security guidelines and the FTC has repeatedly refused to offer any "exact or direct" reason for requesting the credit reporting information, he added.

The FTC did propose that Chilton's records be stored in a Washington, D.C., depository outside the FTC's offices, Sutton continued. If they were, the privileged material couldn't be accessed under a Freedom of Information Act request because it wouldn't be in the agency's possession.

However, since FTC staff members would have access to the depository and, consequently, take notes during the course of the investigation, the notes would be available under the Freedom of Information Act, he pointed out.

Chilton Corp. also asked the FTC for a "predetermination" that all of the information delivered under the subpoena be classified as trade secret data and be exempt from Freedom of Information Act restrictions. "The merge and purge and display rules and algorithms we use in the computer system are part of what the FTC wants," Sutton said.

However, the FTC reportedly refused to agree to any of Chilton Corp.'s security demands.

When contacted, an FTC spokesman refused to comment on the investigation, but said an agency commission would decide how to handle Chilton's refusal to obey the subpoena. The commission could either narrow the scope of the writ, relieve Chilton from complying or render the subpoena ineffective, according to David Federbush, an FTC staff attorney.

Two years ago, TRW Credit Data filed a motion to quash or limit a subpoena served by the FTC that requested the same type of information. Federbush refused to comment on either the success or failure of that action.

Part of the reason Chilton Corp. and the three other credit reporting organizations may be involved in the study is because of TRW's earlier complaints about the FTC examining its records, Sutton believes: "When they [TRW] first got the subpoena. . .they argued that the FTC shouldn't be investigating just them."

TRW insisted that its standards of accuracy be measured against those of the other vendors as well, Sutton said, "but that's not from the FTC, because [staff members] wouldn't tell us why they were investigating us either."

### Prepared to Fight

Meanwhile, J.E.R. Chilton III, Chilton Corp.'s chairman of the board, said he is prepared to fight the subpoena and the FTC's request all the way to court. In a recent letter to Chilton Corp.'s shareholders, Chilton noted that the size and operating procedures of the company, in relation to others, makes it unfeasible to submit to the FTC's demands.

"Having exhausted all means of reasonable accommodation, we have been given no alternative but to guard the competitive heart of [Chilton Corp.'s] system," Chilton stated. "Should the commission refuse to limit or quash the subpoena, that subpoena must be enforced through a federal district court and, in that arena, we feel reason will prevail."

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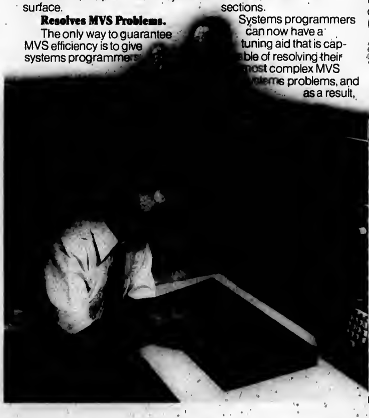

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# Career Conference for Women Set for March

By a CW Staff Writer

ALBUQUERQUE, N.M. — The University of New Mexico, which will hold a National Science Foundation (NSF)-funded career conference for women here March 3-4, applied for the NSF grant because it felt women do not get adequate vocational counseling, according to Nancy Martin, the university's Women in Science project director and associate professor in its Computing and Information Sciences Department.

Even though New Mexico has passed the Equal Rights Amendment, "the state is a good five years behind the East Coast in realizing the potentials of women," Martin said.

About 150 professional women scientists have been lined up so far to speak at the conference, which will include three computer science workshops.

One workshop will discuss the educational requirements for computer science careers and the preparation needed for entering such academic programs. Another will outline career opportunities in the field including the national distribution of jobs, salary ranges and potential for promotions.

The third will provide in-depth discussions by women professionals in computer science about some of their on-the-job projects and the state of the art in their specialties.

## Scheduled Speakers

Among the speakers will be "a large number of applications programmers, a few Ph.Ds specializing in symbolic processing, artificial intelligence and numerical analysis and at least two women working as systems programmers," Martin noted.

Asked why professional speakers at the conference are mostly — if not all — women, Martin said the conference is for college freshmen and sophomores, and women at this educational level "would feel less inhibited in an 'all-female environment.

"Many, especially in a state like New Mexico, have questions like, 'What will entering these kinds of careers do to my femininity?' "

## Science Aptitude

The $10,000 NSF grant funding this conference will admit 200 female freshmen and sophomores who demonstrate an interest in and aptitude for science. Martin said the university is using as criteria a general-interest questionnaire and past science and math courses taken.

Once accepted, the students must attend all workshops; a $3 registration fee covers refreshments.

While the workshops are geared toward college students, Martin hopes to spin off a university-funded organization to provide similar services and conferences for a broader base of women on a continual basis.

"We would like to get a network of professional women scientists to form an executive committee comprised of one representative from every company and university we can locate in the state to distribute scientific career information to other women in their organizations," she said.

# Lack of Women in DP Seen Serious Loss

*(Continued from Page 1)*

Why are the scales so unbalanced? "There is the equity argument," Callanan said. "There may have been forces in the past that have militated against women studying or participating in scientific careers."

One such force, she noted, "has been sex role socialization that says certain careers are appropriate for men, others for women. Sciences and engineering have traditionally been thought of as male domains.

"There may have been overt or covert job discrimination against women," she added, "but this is not as prevalent as it used to be. I think it's now more a matter of tradition."

## Science Career Workshops

The NSF Women in Science Program is designed to increase the number of women in computer science, engineering and other science professions. The program awarded a total of $244,260 in 25 grants to 23 colleges and universities in 17 states for science career workshops for women.

The 25 NSF-funded workshops were mandated not only to motivate women to consider careers in the sciences, but also to advise them on how to prepare for such professions and to provide job information.

Of the 25 workshops, 16 are for college and university students, one for graduate students and three for alumnae with at least a B.S. degree who are neither in graduate school nor in scientific jobs commensurate with their training.

Each grantee institution selects participants from its own student body and from neighboring colleges and universities, while posteducation workshops carry no geographic limitations.

All NSF-funded workshops cover a wide spectrum of scientific disciplines including computer science and engineering, Callanan noted.

## Cooperative Companies

Asked if the birth of this NSF program was related to the quotas that require business organizations to hire a certain percentage of women, Callanan said, "Not directly, but some companies would look favorably on this program because they are anxious to employ more women and would have a larger pool from which to hire.

"Companies have been cooperative and willing to let their female scientists participate in the workshops," she added. In the past, panelists and speakers at the workshops have included women from industry and government.

"The project directors at the various universities wanted these people to show that the scientific careers out there are not only in academia," she said.

Previously awarded and currently active projects supported by the Women in Science Program include six science career facilitation projects for women with science degrees who are currently not employed or underemployed in terms of their potential.

These projects provide up to 12 months of training to update and augment the scientific knowledge and skills of the participants, Callanan explained. When training is completed, the participants are expected to be prepared to enter graduate school or the job market immediately.

The following universities offer NSF-funded science career facilitation projects: University of California, Davis, Calif.; American University, Washington, D.C.; University of Lowell, Lowell, Mass.; Polytechnic Institute of New York, Brooklyn, N.Y.; University of Dayton, Dayton, Ohio; and University of Texas, Austin, Texas.

# OMB Solicits Comments

WASHINGTON, D.C. — The Office of Management and Budget (OMB) is requesting comments on federal procurement regulations proposed to help implement President Carter's inflation-fighting program.

The proposed regulations will ensure that the federal government buys goods and services from companies in compliance with the wage and price standards the President outlined Oct. 24 [CW, Oct. 30].

OMB Director James T. McIntyre Jr., in releasing the proposed regulations, said "the President wants the government to contract only with companies which cooperate in the fight against inflation."

The main features of the proposed OMB regulations are:

- Solicitations issued after Jan. 1 for new contracts will include a provision requiring the contractor to certify that he is in compliance with the wage and price standards.
- Companies determined by the Council on Wage and Price Stability to be noncompliant will be ineligible for federal contracts or subcontracts.
- Companies which certify their compliance but are later found not to have been in compliance at the time may be terminated for default.
- Waiver of the contract certification will be considered only "because of an urgent national security or public safety [consideration] and where there are no alternative sources."

The deadline for comments is Dec. 1. They should be sent to the Office of Federal Procurement Policy, OMB, Room 9013, 726 Jackson Place N.W., Washington, D.C. 20503.

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## *For Information Policy*

# Revamp Team Drops Call for Presidential Aide

**By Jake Kirchner**
CW Washington Bureau

WASHINGTON, D.C. — The final report of the President's reorganization project for federal data processing, expected by year's end, will not recommend appointing a special assistant to the President for information policy, as was called for in the draft version of the report circulated earlier [CW, Sept. 11].

During a session of the Federal Computer Conference held here recently, several members of the reorganization project discussed the recommendations to be contained in the final report, now being prepared under the direction of A.P. Jensen, Carter Adviser from the Georgia Institute of Technology's School of Information and Computer Science.

Jensen told the conference attendees a minority opinion will be included in the final report advocating the special assistant position. About 30 to 40 of the project's 55 members wanted. the White House backing. Such a position would add to the project's recommendations, he said.

### Controversial Point

The recommendation to establish a special assistant to the president for information technology policy, plans, and programs (ITP) was a controversial point among the project members even before the draft version of the project report was prepared several months ago.

That version called the recommendation "somewhat controversial" and reviewed the pros and cons of establishing the White House position. The draft gave as an argument for the proposal the hope that the position "would place close to the President the responsibility for seeing to it that long-term policy for this crucial [information] technology is formulated."

In addition, the report said, "It would offer hope of getting ahead of the game in dealing with issues that in the past have been recognized late and dealt with in disarray.

"The establishment of a special assistant for ITP is the only option available that would neither create a large bureaucratic entity nor delegate the responsibility for the solution of urgent information technology problems to agencies [Office of Management and Budget (OMB), for instance] that have in fact been partly responsible for the very existence of those problems."

### Arguments Against

The draft version of the report noted there are equally strong arguments against the special assistant position. "The creation of such an office could be interpreted as detracting from the principle [stated in the report] that information policy and information management should be a part of every federal agency and, as an all-pervasive function, should be highly distributed for decentralized advocacy.

"Questions such as privacy, security against fraud and constraint on the international flow of information are directly intertwined with already existing base functions throughout the federal government. The placement of new responsibilities in the White House might be considered contrary to the spirit of diffusing supporting policy functions throughout the government."

It was also noted that "the creation of such an office could be interpreted as an attempt to place another special-interest advocate within the Executive Office of the President ... There is also some danger that a special assistant for ITP would act in the name of the President, but without the President's informed consent."

In addition, some members of the reorganization project have pointed out that very similar arguments were raised in deciding to abolish the former White House Office of Telecommunications Policy (OTP). They argue that it would be unwise to create an office (ITP) almost identical to one previously judged unnecessary and undesirable.

### Main Impetus

The Federal Computer Conference panel noted the main impetus for recommending the special assistant position was the recognition of the need for a dramatic change in the way information policy is made and the way DP resources are acquired and used in the federal government.

Brigadier General L.J. Riley, deputy commanding general of the U.S. Army Computer Systems Command and a reorganization project member, told the session attendees, however, "The establishment of such a position would be detrimental to the success of the other recommendations in the report."

The report recommends more responsibility for DP at the program management level, he noted, which does not fit the idea of creating a centralized, upper management level position for that responsibility.

The fact that OMB has not been able to effectively offer DP management guidance for the federal government, as mandated by the Brooks Act (Public Law 89-306), does not mean that office might not do better with greater funding and a stronger mandate, he argued.

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### *After Intense Debate*

# Brazil's DPers Solidify National Policy Stance

**By Ney Seara Kruel**
Special to CW

RIO DE JANEIRO, Brazil — After five days of intense debates at the recent 11th National Congress for Data Processing here, delegates from all of Brazil's DP organizations agreed on a resolution that spelled out their views on a national informatics policy.

Their report included a warning that in developing countries like Brazil, the introduction of the computer into vital activities such as social security services, tax collection, banking networks and even police records makes it a most important instrument of social change.

Considering the minimal participation of individuals in the decision-making processes of private corporations and government agencies today, the use of computers in all aspects of societal control is a disquieting factor, the resolution said.

A good example is the government project of a universal identifier. In order to rationalize civil service practices, a single register for all citizens would be a very practical solution, according to a member of the committee charged with the creation of the National Register of Natural Persons (Renape).

This register would be controlled by a joint commission of representatives from the ministries of justice, labor, finance, social security, planning, the armed forces and the National Information Agency. "Civil registers are not only a need of the state, but also of the citizen. If the state protects the citizen, if the state 'tutors' him, it has to know whom to protect," the committee member said.

The DP community in Brazil does not seem to share the same views, however. The final report of the conference recommends that the government "definitively abandon the studies for the creation of a universal identifier and stop the Renape project."

Stressing that the right to privacy is closely intertwined with other individual rights, the report added that "regulations must be instituted to avoid any abuse in the handling of information on the private life of citizens filed in computers and to give them permanent access to these files."

## National Sovereignty

The privacy issue in Brazil has another important aspect: national sovereignty. The evolution of data banks together with the growing improvement of international communications services has created a great concern for the possibility of other countries' increased use of strategic information on Brazilian economic and social conditions, as well as on Brazilian individuals.

The report echoed these concerns in several of its recommendations. Even though the marginal cost of information filing and retrieval in foreign data banks is lower than that of creating internal data banks, it was recommended that "data banks for social and economic information should be kept within domestic boundaries as an imperative of national sovereignty."

This nationalistic bias has the intention of making the presence of domestic DP corporations, private or state-controlled, a hindrance to the "unlimited expansion of multinational corporations" in order to retain control over such a strategic section. It is believed the "unfair" competition of corporations with greater technological capacity can only be checked by government protection.

Previous experience in other countries has proven this difficult to understand through traditional economic theories and more difficult to develop because of strong international pressures.

The technological problems, then, cannot be left out of the privacy issue framework in a developing country like Brazil. The creation of a national DP industry here in the last few years has been the beacon for further policy arrangements vis-a-vis the large multinational corporations of the sector. Starting with the manufacture of minicomputers, the Brazilian DP industry — and market — has shown considerable potential to extend this to larger systems and projects, for medium-sized computers are already being made. This has created a dynamic process of inward-oriented policies with frequent clashes in the international environment.

International data flow, for instance, has been curbed by a government regulation that requires firms to seek approval from the Commission for the Coordination of Electronic Data Processing (Capre) before transmitting such information over international

(Continued on Page 11)

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# DP Helps Boost U.S. Trade Balance

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The Commerce Department reported a $480 million favorable balance of U.S. trade in electronics products during the first half of 1978.

Exports for the first half totaled $5.4 billion and imports were $4.8 billion for a total two-way trade of $10.1 billion.

Consumer electronics made up 46% of imports, followed by electronic components with 26%. Computers and related equipment provided 35% of exports and electronic components 27%.

## *Data Bank Urged On Toxic Substances*

A group representing four regulatory agencies has recommended the development of a computerized federal directory of all laws, existing and proposed regulations and guidelines concerning toxic substances.

The work group, part of the Interagency Regulatory Liaison Group (IRLG), also looked at the possibility of developing an integrated system for the collection, retrieval and analysis of data from studies on toxic substances. The group said existing systems and those under development could be modified to provide the required capabilities, according to the group.

The IRLG, formed in August 1977, includes the Occupational Safety and Health Administration, the Environmental Protection Agency, the Food and Drug Administration and the Consumer Product Safety Commission.

In recommending the computerized directory, the work group said it had interviewed both private-sector and government personnel and found no comparable system exists. There was an expressed interest in and need for such a system, it noted.

## Brazilian DPers Solidify Stance

*(Continued from Page 10)*

telecommunications lines.

The conference report, consistent with this line of action, has proposed the creation of special legislation for the control of international data transmission systems "in order to protect the interests of the Brazilian society."

Within the framework of a national informatics policy — a government-oriented set of regulations — the "protection of the Brazilian society" seems contradictory in terms of normal privacy standards.

However, the complexity of the development of a government-protected domestic industry, together with the growing concern for excessive government interference in the individual lives of its citizens, has created in Brazil a unique situation in which individuals, of cold economic necessity, need to have greater control over government policies since it is through government help that the domestic industry is developing. Thus the need for privacy rights has also become an urgent political necessity for increased participation in government decision making.

# Washington Update

## *Commerce Picks Day As NTIS Director*

Dr. Jordan J. Baruch, assistant secretary of Commerce for Science and technology, recently announced the appointment of Melvin S. Day as director of the National Technical Information Service (NTIS).

Day was previously deputy director of the National Library of Medicine and has held management positions with the National Science Foundation, where he was director of the Science Information Service, and with the National Aeronautics and Space Administration.

NTIS is the center for government-sponsored scientific and technical information.

## *Adapso Relocates In Nation's Capital*

The Association of Data Processing Service Organizations (Adapso) has moved its executive offices to the Washington, D.C. area.

Jerome L. Dreyer, Adapso executive vice-president, said the move from the previous headquarters site of Montvale, N.J., was originally scheduled for next spring.

Byrne O'Brien has been appointed the association's director of administration and finance, and Michael Nugent is the new Adapso staff attorney.

"With our new offices in the Washington area," Dreyer said, "we can expand our efforts on behalf of our member companies with Congress, the regulatory agencies and other government organizations that are also headquartered locally."

The new Adapso headquarters are at 1925 N. Lynn St., Rosslyn, Va. 22209.

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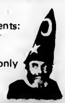

# GAO Labels Federal DP Security 'Inadequate'

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The DP security programs of many federal agencies are inadequate, reflecting an apparent lack of interest on management's part, a not-yet published report by the General Accounting Office (GAO) charges.

The report, discussed in detail at the recent Federal Computer Conference here, "is not too complimentary to the agencies," according to Robert G. McKenzie of GAO's Logistics and Communications Division.

McKenzie, who presented an outline of the report, said every agency reviewed had a security program of some sort, but most "lacked the management support needed to achieve comprehensiveness."

The primary problem the GAO found was that security functions are not at a high enough management level and management in general does not get sufficiently involved in or get enough feedback on security programs to assure their efficacy.

Ten agencies, including the Civil Service Commission, the Postal Service and the Social Security Administration, were selected for review. They were chosen, according to McKenzie, because they possess personal or sensitive data in their computer systems or because they process data by remote terminals.

A major finding of the investigation was that security organizational structures in the 10 agencies are often inadequate for independence and control. McKenzie cited lack of separation of security and DP operations as a factor in the inadequacy.

Whenever security and operations conflict and are under the same management, he said, the demand for smooth operations usually wins out over the need for security.

The study found a general problem in designating responsibilities for security programs. Responsibilities often are not clearly defined or are fragmented or overlapping, the GAO said. In some cases no single person is in charge of security.

A lack of comprehensive security procedures for monitoring and reporting, training, backup and contingency and violation reporting was cited by the GAO.

The agency found little use of risk management because of low priority and lack of management concern. "Intuitive selection of safeguards at most agencies results in little assurance that they minimize the risk or are cost-effective," the study said.

The GAO also found a general lack of adequate guidance on how to perform a complete risk analysis for all types of safeguards. Most agencies have not done the data sensitivity analysis that is the first step in designing a security program, it noted.

### Examples of Noncompliance

The GAO found many instances of noncompliance with security procedures, such as password changes for departing system users not accomplished; sensitive computer output not marked; security officers and staff not knowledgeable of computer technology; terminals not secure; no contingency plans or formal backup agreement; and, in some cases, no security training provided to DP personnel and system users.

More internal audit involvement is needed in reviewing security in existing and new systems, the GAO said. Cases of limited audit involvement result from a lack of top management support or direction, low priority for DP security audits in general and inadequate resources and lack of expertise to study security programs in detail.

The GAO also found inadequate security training. Limited or no training at all was provided to many DP operators, designers, programmers and system users, the study said.

Another widespread problem was inadequate background investigations of personnel. In many cases, only top management got full clearance, and there were often no follow-up investigations or procedures for identifying and investigating disgruntled employees involved with sensitive data.

The GAO study produced a long list of other administrative problems in the agencies' security programs, including physical and technical safeguard problems. The review found such problems as user manuals and portable terminals being taken home overnight by employees.

### Study Suggestions

The GAO concluded that top management must direct and provide resources for a "concerted program of computer security." To that end, the study suggested that government agencies:

- Establish an independent security function with necessary authorization to control the program.
- Establish comprehensive policy, plans and procedures.
- Use a risk management approach to safeguard selection.
- Perform continuous monitoring and reporting to correct deficiencies and point up needs for new risk management.
- Introduce more internal audit involvement in computer security matters.
- Assure adequate training in security.
- Perform more extensive background investigations, with follow-ups, on federal and contractor employees processing sensitive data.

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## *Amdahl Suggests Two Rules*

# Users Advised to Improve Software Skills

**By Ronald A. Frank**
CW Staff

WASHINGTON, D.C. — Software methods will have to be improved over the coming years if users are to get optimum use from their large mainframes, according Dr. Gene Amdahl, founder and chairman of Amdahl Corp.

Speaking at the recent Federal Computer Conference here, Amdahl advised users to follow two main rules in developing software.

First, he said, it is essential to maintain a set of rigid programming rules so software is portable when applications outgrow the system on which they were developed. This is critical if expensive conversion efforts are to be avoided, he remarked.

Second, users should maintain strict control over the structure of files. File structure is really "the lifeblood of a transaction," Amdahl noted, and if this is not controlled correctly, operating problems will result.

Often files outgrow peripheral devices' capacity to handle them, and when a transfer becomes necessary to upgrade I/O units, the software must be adaptable to such a change without a major rewrite.

The average user now spends two-thirds to three-quarters of his programming hours in program maintenance, Amdahl said, attributing this to the way applications programs change with time. As a result, it is important for users to structure their programs with greater clarity, he explained.

Amdahl Corp. has been doing research in this area and will soon announce a software product called VM Program Enhancement (VMPE) that will allow Amdahl CPU customers to optimize their VM/370 operations.

Specifically, VMPE will allow a CPU to run a production copy of IBM's MVS on top of VM/370 without additional overhead. This capability will be introduced soon, Amdahl said.

Users will have to find methods to keep software as orderly as possible during these days of transition, Amdahl observed, or upgrades will move faster than customers can keep up with them.

# DOD Language Named

**By Robert L. Glass**
Special to CW

WASHINGTON, D.C. — "Ada" has been chosen as the name for the forthcoming Department of Defense (DOD) computer programming language.

The language was named after the first programmer in history, according to Lt. Col. William A. Whitaker of the Defense Advanced Research Projects Agency.

Ada Augusta, Countess of Lovelace, was one of the few contemporaries of computing pioneer Charles Babbage who understood his work on calculating machines.

When Babbage created his Difference and Analytical Engines in the early part of the 19th century, Augusta wrote a program for computing Bernoulli numbers.

She translated into English a significant paper on Babbage's work and added her own comprehensive notes about machine usage and even corrected errors in Babbage's work.

Augusta, the daughter of the poet George Gordon, Lord Byron, was also an accomplished musician.

With the selection of its name, the DOD effort is now on schedule. First definition of the language will be made in April 1979, and the first funded compiler, produced for the army, is expected in May 1981.

The announcement of the name selection was made by Whitaker at a quarterly language review here held to evaluate the competing language definitions.

## Corrections

In "Graphics Systems Worth Initial Pains" [CW, Oct. 30], the speaker is quoted as saying that "business managers must undergo a trial by fire" and take the time to learn how to use their computers. However, the article failed to note that this was true in previous years and not today.

Human Resource Systems, a minority recruitment firm for the DP industry [CW, Oct. 16], is not in Los Angeles. The company's correct address is DelAmo Financial Center, Suite 225, Wells Fargo Bank Building, Torrance, Calif. 90503.

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## *By System in Mobile Unit*

# First Detroit Marathon Scored

DETROIT — A computer system was deployed at the finish line of the first Detroit Free Press International Marathon last month to process and print out the names and times of winners in more than 14 race categories.

The Burroughs Corp. B800, housed in one of the company's mobile demonstration units, was surrounded at the finish by a large crowd which erupted in cheers and applause as runners completed the 26-mile, 385-yard course.

The race results were especially important to those entrants who finished fast enough to qualify for the biggest event in running — the annual Boston Marathon, held in the spring. Men must finish in three hours to qualify, women in three and a half hours.

Operating with Burroughs' Results Analysis, Computation and Evaluation (Race) software program, the B800 provided fast results for judges, the news media and finishers at the Oct. 22 race.

The data base consisted of information about each entrant such as his running number, name, address, age, weight, citizenship and club or organization. As runners finished, their entrant numbers and times were entered into the computer through Burroughs TD 800 data entry terminals.

The computer then calculated the winners in the various age, sex and special categories. A complete printout of finishers and their times appeared the following day in Detroit newspapers.

In addition, a computer-printed certificate was awarded to each runner who finished the marathon.

### 'Underwater' Mile

A unique part of the course was what is believed to be the first "underwater" marathon mile. After two miles on Windsor streets, runners went "underwater" through the Detroit-Windsor tunnel. Although hundreds of marathons are held annually, none runs through a major tunnel.

The one-mile passageway linking Canada and the U.S. was closed to traffic before the race started. The air in the tunnel was exchanged six by 24 huge ventilation fans to assure air purity for the marathoners.

Bob McOmber, a 27 year-old instructor at Bowling Green State University, crossed the finish line first in 2:17:37. With a time of 2:55:51, Erma Tratner was the first woman.

*Mobile demonstration units equipped with computer systems were at the finish line of the first Detroit Free Press International Marathon to provide almost instantaneous results for judges, the media and entrants.* →

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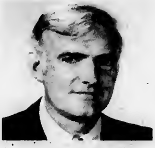
# *Mass. Council Picks Foley*



Howard P. Foley

BOSTON — The Massachusetts High Technology Council (MHTC), an organization of 83 technologically oriented companies based within the state, has appointed Howard P. Foley as the association's executive director.

The MHTC represents a combined employment force of more than 138,000 people worldwide and over 70,000 in Massachusetts. The objective of the council is to improve the environment for high technology industries by promoting communication and cooperation within the industry itself and with financial, educational and governmental institutions.

Foley will be responsible for implementing the MHTC's plans and programs as well as coordinating the efforts of the member companies and local government agencies.

# Three-Day Conference To Discuss Networks

WASHINGTON, D.C. — The concepts and problems of the emerging network environment for communications will be examined at Communication Networks '79, which will be held Jan. 30 to Feb. 1 at the Sheraton Park Hotel here.

The conference will combine a number of forums on communications network policy and technological trends with an exposition of communications hardware, software and services.

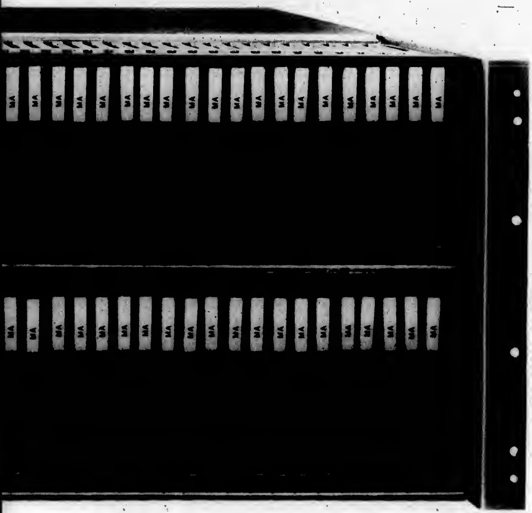
Richard E. Wiley, former Federal Communications Commission (FCC) chairman will be the keynote speaker. Wiley will also lead a session on the outlook for revising the Communications Act of 1934.

Speakers at that session will be Rep. Lionel Van Deerlin (D-Calif.), chairman of the House Subcommittee on Communications; Walter Hinchman, former head of the FCC Common Carrier Bureau; William G. Sharwell, vice-president of AT&T; and A.G.W. (Jack) Biddle, Computer & Communications Industry Association (CCIA) president.

Other highlights will include a regulatory affairs meeting; a "Futurists Field Day" panel in which speakers will offer a variety of technological forecasts for network development in the 1980s; and a luncheon address by Henry Geller, assistant secretary of Commerce for computer and communications affairs, who has been working within the federal government to restructure policy and supervision of the communications and information flow marketplace.

A number of afternoon workshops will cover such topics as network planning and design and software for communication networks.

The conference registration fee is $295, with a $25 discount for preregistration before Jan. 1. Further information is available from The Conference Co., 60 Austin St., Newton, Mass. 02160.



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[illegible] INDUSTRY

10 Manufacturer of Computer or DP Hardware/Peripherals
20 Manufacturer (other)
30 DP Service Bureau/Software/Planning/Consulting
40 Public Utility/Communication Systems/Transportation
50 Wholesale/Retail Trade
60 Finance/Insurance/Real Estate
70 Mining/Construction/Petroleum/Refining
75 Business Service (except DP)
80 Education/Medicine/Law
85 Government - Federal/State/Local
90 Printing/Publishing/Other Communication Service
95 Other ____________

[illegible] FUNCTION

11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Finance Officer
21 Director/Manager of Operation/Planning/Administrative Service
22 Director/Manager/Supervisor DP
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mfg Sales Representative
52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
80 Librarian/Educator/Student
90 Other ____________

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## *NSF's Atkinson to Keynote*

# ACM Sets Annual Meeting in Capital Dec. 4-6

COLLEGE PARK, Md. — Nearly 100 sessions on topics ranging from computer systems and networks to software psychology will be presented at the Association for Computing Machinery's (ACM) annual meeting in Washington, D.C. on Dec. 4-6.

The three-day meeting, featuring both industry and government representatives, will focus on artificial intelligence applications, programmer overtime, the automated office, data base management systems, computer architecture, microprocessor technology and computers in education, a spokesman stated.

Graphics, software development and transborder data flow will also be discussed during the program.

Richard Atkinson, director of the National Science Foundation (NSF), will deliver the keynote address and Daniel McCracken will give his views on the state of the ACM.

Concurrently, the ACM will host the ninth North American Computer Chess Tournament during which 12 teams are expected to pit their computer programs against each other, and students will participate in the Capital Region Scholastic Programming Contest.

Registration fees for the ACM sessions are $85 for nonmembers, $60 for members and $15 for students. In addition, $25 of the nonmember fee may be applied toward the $35 fee for ACM membership at the conference site.

Additional information and a preliminary program are available from Richard Austing, ACM 79's general chairman, Department of Computer Science, University of Maryland, College Park, Md. 20742.

# Cost Control Conferences Scheduled for Three Cities

HERSHEY, Pa. — A series of conferences on cost control sponsored by the Bank Administration Institute (BAI) will be held here Nov. 28-30. Conferences will also be held in Minneapolis on Dec. 11-13 and in Omaha, Neb. on March 19-21.

Sessions will deal with the fundamentals of a cost control system including case studies of successful programs and discussions about cost considerations of automated customer services, a BAI spokesman said.

Cost savings possibilities derived from product pricing, employee motivation, reduction of teller differences, prevention of internal fraud and developments in check processing will also be reviewed.

The fee for the November conference in Pennsylvania is $125 for BAI members and $150 for nonmembers.

For the Minneapolis and Omaha conferences, the fees will be $135 for members and $160 for nonmembers.

Further information is available from the BAI at P.O. Box 500, 303 S. Northwest Highway, Park Ridge, Ill. 60068.

# *Programming Contest Open to Students*

WASHINGTON, D.C. — Students in grades 7 to 12 who are proficient in the use of computers and programming are invited to participate in the Association for Educational Data System's 1979 computer programming contest.

The puropse of the contest is to recognize those students who develop outstanding projects in the field of programming. Prizes will be awarded in the categories of business, biological and physical science, computer art, computer science, games, simulations and mathematics.

A category has been added to recognize programs developed by junior high school students, a spokesman said. However, these applicants are also eligible to compete in any or all of the other listed areas.

Application forms and further information can be obtained from the association's headquarters at 1201 16th St. N.W., Washington, D.C. 20036.

# Government DP Executive Elected DPMA's President

NEW ORLEANS — The Data Processing Management Association (DPMA) has elected George R. Eggert, a DP executive with 23 years' experience in the federal government, as its 1979 international president.

A DPMA member since 1955, Eggert is chief of the Office of Planning and Management for the Department of Defense's Contract Administration Services Region (DCASR), based in Chicago.

At DCASR, Eggert is in charge of planning, organization and promotion of a centralized management organization, including creation and maintenance of a $28 million program budget.

A member of the advisory council of the Information Privacy Research Center at Purdue University, Eggert has also served on a working committee of the American Federation of Information Processing Societies, which, in conjunction with the Executive Branch's Office of Management and Budget, reorganized DP and administration functions in the government.

George N. Eggert

Eggert is a member of the Editorial Advisory Board of *Information Privacy*, a magazine published in England.

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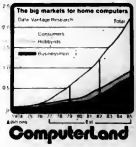

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## *Details Median Age, Income*

# System Gives Realtors Neighborhood Profiles

**By Tim Scannell**
CW Staff

STAMFORD, Conn. — Residential real estate brokers, appraisers and corporate relocation companies have at their fingertips a computerized listing that can provide such information as the median age, median income, mobility ratio and average number of children in any given neighborhood within the U.S.

Donnelley Marketing's Community Profile System (CPS), introduced earlier this year and just recently made available on a nationwide basis, translates statistics gathered from the U.S. Census Bureau, standard telephone directories and other publicly accessible sources into specific names and addresses. The system covers more than 65 million households, nearly 85% of everyone in the U.S.

"A [house] is the single largest purchase a family makes," Robert Swick, Donnelley's marketing manager, explained "and while the [real estate] industry does a very fine job of giving an explicit description of the property a buyer is thinking of acquiring, it astutely avoids giving any information on the perspective of a neighborhood."

### Pick Your Flavor

A significant portion of a broker or relocator's responsibility is to "identify" the surroundings and give the prospective buyer an accurate view of the type of people residing in a certain area, Swick continued. The CPS does this by presenting "the different flavors, life-styles and characteristics of the communities."

Subscribers pay about $500 for each market or geographic sector which is usually the density of "at least a county and may be as high as two counties," Swick said. The listings or packages are updated annually and contain direct mail labels, telephone prospecting cards, infield portfolios and color-keyed maps that break down and simplify the formidable mass of statistical data.

The realty profile package is subdivided into four categories of use, Swick pointed out. First, as a managerial aid, the system identifies the characteristics of each neighborhood including the types of households — apartment or single family.

"This gives an office manager a perspective of how well his business is doing in relation to what's out there," Swick stated. Annual statistics also help the realtor keep track of the competition within a particular area.

### Help for Realtors

Realty companies can use the managerial portion of the CPS as an inhouse training aid; it uncovers the specific names and addresses of key audiences that tend to be clouded by statistics.

"The real estate industry is suffering from a high degree of turnover," Swick noted. In fact, 30% to 40% is usually considered the norm, as agents drift from one agency to another or leave the business entirely.

"The CPS gives a manager a handle on how to make a new associate effective quickly by giving him a list of potential prospects." Previous methods included poring over newspaper lists and "crisscross" directories as well as initiating "cold" door-to-door calls, Swick explained.

The system's second feature, a prospecting tool, gives the agent all necessary materials to conduct business in a "disciplined, logical way," Donnelley's spokesman said. "The industry has worked an awful lot on the art of selling as opposed to the science of selling." The preaddressed labels, telephone cards and geographic portfolios make up this aspect of the package.

### For Shuffled Executives

A corporate relocation aid is the third CPS offering and is geared toward executives who may be shuffled around the country frequently during their climb up the company's "ladder." Realtors, summoned by a corporate manager either facing relocation or relocating a staff member, can show and describe an area's characteristics. "If a guy's only got two years in a community, he should make the most of it from a social as well as an economic point of view," Swick said.

For instance, IBM employees like to relocate to areas that have a high turnover or mobility rate. "They know they're only going to be there for a few years so in a highly mobile area wives are able to make friends more quickly, the kids get along together faster and the family becomes a part of that neighborhood sooner," Swick explained.

The last aspect of the system is a home buyer orientation guide. This particular feature matches the views, life-styles and socioeconomic idiosyncrasies of a prospective buyer with those of a certain neighborhood.

People moving into a new area usually have preconditioned ideas of where and how they want to live, Swick stated. "CPS lends a little logic to this whole scheme of things."

### Yearly Update

The CPS statistics are updated each year at a centralized DP facility just outside Ames, Iowa. An IBM 370/158 processes U.S. Census Bureau figures as well as statistics derived from "standard mathematical analysis techniques." It compares this data with information kept in Donnelley's master data base which contains names, addresses and information on 85% of the U.S. population.

Extensive security precautions are used to protect information in Donnelley's computerized files. These files contain name, residence and telephone number (and how long the number has been listed in the telephone directory).

The data also includes a "quantum set of demographic identifiers" that inversely relate to the consumer. Median income, occupation, education level and family size are detailed, Swick explained.

Donnelley has been in the direct mailing industry for more than 50 years and claims to have the largest residential data base in the U.S. A great deal of the company's direct mail marketing efforts are in behalf of manufacturers which use Donnelley's detailed lists to send monthly coupons and announcements to millions of consumers.

Although the computerized targeting system is designed for the real estate industry, the service is openly marketed to chambers of commerce, regional planning agencies, research libraries and other interested subscribers.

### Authenticity Check

However, the authenticity of each person requesting demographic information is routinely verified, particularly if the person or organization is not a member of the National Association of Realtors (NAR), a nationwide industry consortium, Swick said.

"We just don't pick up anyone who writes in and says, 'Give me 300 names and addresses of people down the street here,' " Swick stated. "We have very tight security control."

In fact, the NAR has been very encourageing about Donnelley's CPS from the very beginning, Swick said. "There are many courses out there and many instructional manuals that try to tell the broker how to do his business, but literally there is a dearth of products and services that really apply all of this theory."

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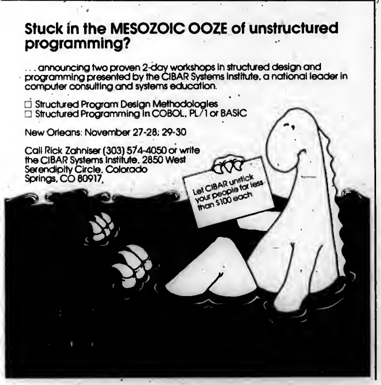
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# Recollections, Anecdotes Sought on DP History

ANN ARBOR, Mich. — Articles, anecdotes, personal recollections and commentaries are currently being solicited by the editorial board of a quarterly that will be published by the American Federation of Information Processing Societies (Afips).

The *Annals of the History of Computing* will focus on events and developments that occurred at least 15 years prior to the date of publication of each issue.

The journal will also include descriptions of historical projects; collections of private, historically relevant letters; articles on the influence of societal factors on DP's development; reports of significant computing successes and failures; and annotated bibliographies of computer-related publications, a spokesman stated.

*Annals* is an outgrowth of an Afips publications committee study on whether to create a journal to record vital contributions to DP.

Prospective contributors can contact Bernard Galler, editor-in-chief of the *Annals*, at the University of Michigan's College of Literature, Science and the Arts, 2522 LSA Building, Ann Arbor, Mich. 48109 for additional information.

Charter subscriptions are priced at $15 for members of Afips constituent societies, $20 for nonmembers and $40 for institutions. All subscriptions should be mailed to Afips Press, 210 Summit Ave., Montvale, N.J. 07645.

# Calendar

Nov. 29, Dearborn, Mich. — **Seminar on Data Management System II (DMSII).** Contact: MIS International, Inc., 31350 Smith Road, Romulus, Mich. 48174.

Dec. 1, San Francisco — **Development of Computer Courseware Authoring Techniques,** sponsored by the Association for Educational Data Systems (AEDS). Contact: AEDS Workshops, P.O. Box 951, Rolla, Mo. 65401.

Dec. 4-6, Washington, D.C. — **The Data Base Course.** Contact: Management Resources International, 6621 Electronic Drive, Springfield, Va. 22151.

Dec. 4-6, Atlanta — **Laser Beam Information Systems.** Contact: The University of Chicago, Center for Continuing Education, 1307 E. 60th St., Chicago, Ill. 60637.

Dec. 4-6, Atlanta — **Minicomputers and Distributed Processing.** Contact: The University of Chicago, Center for Continuing Education, 1307 E. 60th St., Chicago, Ill. 60637.

Dec. 6-8, Washington, D.C. — **DP for Non-DP Managers.** Contact: Management Resources International, 6621 Electronic Drive, Springfield, Va. 22151.

Dec. 6-8, Kingston, R.I. — **Management Skills Development for First and Mid-Level Managers.** Contact: College of Business Administration, University of Rhode Island, Kingston, R.I. 02881.

Dec. 6-8, Boston — **Data Base Design '78.** Contact: AMR International, Inc. 1370 Ave. of the Americas, New York, N.Y. 10019. Also being held Dec. 11-13 in Denver.

Dec. 6-8, Washington, D.C. — **Data Processing Operations Management.** Contact: The University of Chicago, Center for Continuing Education, 1307 E. 60th St., Chicago, Ill. 60637.

Dec. 8, Syracuse, N.Y. — **Management Information System Concepts for Educators,** sponsored by Association for Educational Data Systems (AEDS). Contact: AEDS Workshops, P.O. Box 951, Rolla, Mo. 65401.

Dec. 11-12, Washington, D.C. — **The Emerging Revolution in Health Records Policy.** Contact: AMR International Inc., 1370 Ave. of the Americas, New York, N.Y. 10019.

Dec. 11-13, Chicago — **Project Management for Computer Systems.** Contact: The University of Chicago, Center for Continuing Education, 1307 E. 60th St., Chicago, Ill. 60637.

Dec. 11-13, Washington, D.C. — **DP Systems Analysis for Managers.** Contact: Management Resources International, 6621 Electronic Drive, Springfield, Va. 22151.

Dec. 13-15, Denver — **Distributed Minicomputer Networks,** sponsored by the Institute for Professional Education. Contact: The Institute for Professional Education, Suite 601, 1901 N. Fort Myer Drive, Arlington, Va. 22209.

Dec. 13-15, Washington, D.C. — **Effective Leadership of Data Processing Projects,** sponsored by the Institute for Professional Education. Contact: The Institute for Professional Education, Suite 601, 1901 N. Fort Myer Drive, Arlington, Va. 22209.

Dec. 14-15, Washington, D.C. — **Data Communications: Advanced Concepts and Systems,** sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

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*High Turnout Expected*

# Ifip Sets '80 Congress in Australia

MELBOURNE, Australia — Conference organizers expect between 2,000 and 3,000 registered delegates to attend the 1980 World Computer Congress here, sponsored by the International Federation of Information Processing (Ifip).

The show will be held at Melbourne's Exhibition Building, where more than 60,000 square feet of space will be available for exhibitors. "If there is any doubt about Australia's role in the world computer stakes, the exhibition will cement our foothold until the turn of the century," according to Bryan Humphris, general manager of Ridell Exhibition Promotions, Pty. Ltd.

It will be the largest single computing exhibition ever staged in Australia, he added.

The exhibition should benefit local and overseas manufacturers who want to display the latest in information processing, according to Humphris. He is optimistic that it will bring in potential buyers who otherwise might not be likely to visit Australia.

Melbourne is one of two sites selected for the 1980 Congress; the other is Tokyo.

Information on the exhibition, which the promoters expect will attract Australia's entire computing profession, is available from Ridell Exhibition Promotions, 166 Albert Road, So. Melbourne, Vic., Australia 3205.

# December Seminar to Focus On Preparing Contracts

WASHINGTON, D.C. — A three-day course entitled "Computer Contract Negotiation," starting here Dec. 11, will focus on the legal and financial consequences of preparing computer contracts.

The course will be taught by Dick H. Brandon, internationally recognized computer expert; Sidney Segelstein, a computer law expert; and Joseph Auer, president of International Computer Negotiations, Inc.

The fee is $650 and the course is limited to 60 persons. Additional information is available from Ruth Dargis, Brandon Consulting Group, Inc., 505 Park Ave., New York, N.Y. 10022.

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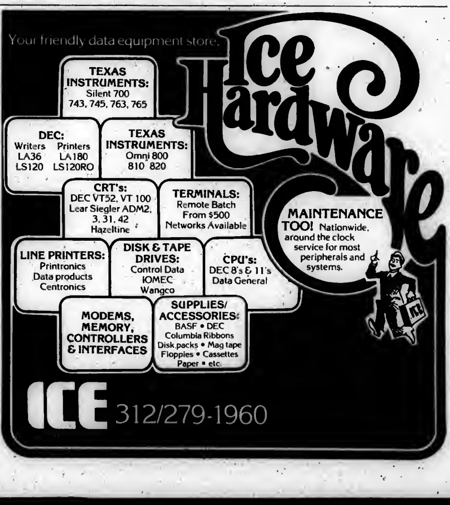

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# Editorial

## Efficiency Steps Backfire

When management blindly accepts a computer-assisted solution to a problem without examining that solution's effect on workers, the results can be devastating.

A case in point is the recent strike of warehouse workers at Safeway Stores, Inc. The strike centers around a system that calculates workloads based upon the body motions of warehouse employees. |CW, Nov. 13|.

But efficiency experts aren't new and neither are the abuses arising from the overzealous application of mechanistic techniques.

During the 1920s, Frederick Taylor, often referred to as "the father of scientific management," observed the hand motions of coal miners to determine the most efficient way of mining. Taylor tried to apply his observations with an eye to making jobs more efficient and teaching workers the best way to approach their tasks.

Building on Taylor's work, many efficiency experts devised techniques to enhance productivity. Eventually, because these methods were viewed as reducing the human being to a machine, many firms abandoned the use of efficiency engineering.

One project frequently alluded to in the annals of organizational behaviorists involves a coal mine in which workers who formerly worked together on a section of a mine were separated and assigned specialized tasks, according to scientific principles of labor management.

However, productivity dropped. Why? The efficiency expert failed to consider that the miners were working together for safety reasons. Their work group was formed not only on the basis of their tasks but also because they needed each other in case of an accident in the mine.

In the recent case, while Safeway's use of an application program to calculate workloads cannot by itself be faulted, the corporation has seemingly neglected to analyze the effect of the computer's solution to the firm's productivity problem.

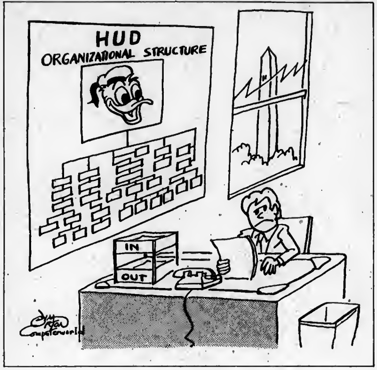
If 90% of Safeway's 250 warehouse employees have been disciplined because of poor productivity since April 1977, as workers have charged, did Safeway try to determine what factors were causing the high failure rate in meeting workload quotas?

The fact that the workers do not understand the system and consider themselves at the mercy of a computer programmer and a supervisor — with no means of verifying the validity of the supervisor's criticism — may be a tipoff to the underpinnings of the problem.

It appears the application program used to solve the problem should have been more thoroughly scrutinized by management earlier to see if the program rather than the people were at fault.

Whether Safeway's management understands that computers are merely business tools and not judges and juries is unknown because it would not comment on the strike.

Surely, though, the strike, now entering its fifth month, is doing nothing to enhance productivity for either the workers or management.



# Data Past

### Five Years Ago
### Nov. 21, 1973

TULSA, Okla. — Judge A. Sherman Christensen reduced by $93 million the amount of damages IBM was to pay Telex Corp. for IBM's violation of the antitrust statutes and significantly weakened the injunctions he had originally imposed on IBM. Nevertheless, the judgment against IBM still called for a hefty $259.5 million payment, three times the actual damages of $86.5 million awarded earlier.

— — —

WASHINGTON, D.C. — The threat of a serious energy shortage confronted users with possible problems in the disk and tape area. Suppliers said they expected a "pinch" in the supply of solvents used to bind ferric-oxide coatings to tapes and disk packs.

### Eight Years Ago
### Nov. 25, 1970

HOUSTON — Twenty-one thousand attended the Fall Joint Computer Conference here. Overall figures showed that the attendance figure was proportionately down from the previous fall's 23,000 but was still somewhat higher than that for other society conventions held earlier in the year.

— — —

DETROIT — In a three-to-one vote, the city's Board of Canvassers, the authority responsible for determining the accuracy of the Nov. 3 punched card election count, refused to certify this city's primary election as final and official. As a result, it was possible that the election, which had its count delayed for 56 hours, could be nullified.

# Letters to the Editor

### Biased, Superficial Attack

Our firm takes strong exception to an article by Alan Taylor that appeared under the sensational and misleading headline "Major Audit Firm Cited for Unethical Practices" |CW, Oct. 30|.

The bulk of the column was a rehash of charges made by a twice-fired City of Detroit employee more than 18 months ago. Because these charges were made at a time when Dennis Green, former finance director of the City of Detroit and later a high-ranking member of President Carter's Administration, was being considered for a federal appointment, the U.S. Attorney and the Federal Bureau of Investigation (FBI) reviewed the matter.

At the conclusion of the FBI investigation, the U.S. Attorney said, in part, "the results of the investigation revealed no violations of federal law, either in the purchase of the system or its present operation, and that as far as (t)his office is concerned, the matter is closed."

In preparing the column, Taylor did not contact us nor, we understand, did he bother to contact the fiscal officers of either the City of Detroit or the Detroit Public Schools.

In short, Taylor's article was so incomplete and slanted that readers should dismiss it out of hand.

Taylor's clear implication that we participated in "payoffs under the table to board members," however, demands more than a simple dismissal. We unequivocally declare this totally unsubstantiated and irresponsible implication to be false.

Richard L. Measelle
Arthur Andersen & Co.
Detroit, Mich.

### Pleased With Andersen

Alan Taylor stated in a recent column |CW, Oct. 30| that Arthur Andersen & Co. was cited for unethical practices because of consulting services the firm provided to the Detroit Board of Education without competitive bids.

Historically, the Board of Education has not solicited competitive bids for professional services provided by architects, attorneys, physicians, management consultants and others. The selection process is based upon an evaluation of the professional competence and technical ability of the firm in providing the required services at a reasonable cost.

Over the years, the Board of Education has utilized the consulting services of several of the leading firms in the audit field.

In addition to Arthur Andersen's work on the district payroll system, the firm has served as board auditors since 1971-72. Its bid of $12,500 for the 1971-72 audit was substantially below the next low bidder. The audit fees the firm has charged since then have been well below prevailing rates for such services.

The school district has been satisfied with the professional services that Arthur Andersen & Co. as well as other consulting firms have provided.

Clement S. Sutton
Chief Fiscal Officer
Detroit Public Schools
Detroit, Mich.

### A Cow of a Different Color

You must have sent one of them city fellers up to Essex Junction, Vt., to cover the new IBM plant |CW, Nov. 6|, and he blew it. Oh, the 64K-bit chip is interesting enough, but the real news is that IBM has gone into genetic engineering and produced, not just one, but "herds of black and white. . . Jersey cows."

Holsteins are black and white, Guernseys are red and white and Jerseys are sort of fawn-colored.

Stuart R. Sheedy
Syosset, N.Y.

## The Human Connection

# Self-Awareness Training Enlivens DPers

**By Jack Stone**
**And Joan Hendrickson**
Special to CW

*Last week Joan Hendrickson gave her impressions of DPers as she tried to find them love mates. She has the unusual occupation of matchmaker for professional peole.*

*This week she tells about another, rather overwhelming experience she had at an intensive self-awareness seminar that sharpened her beliefs about how peole can and should communicate. By chance, a number of DPers attended, and she learned some very interesting things about them in this social environment. Here is how she expressed her perceptions of her experiences at the seminar to me:*

I discovered after I enrolled in the seminar that my decision to join the program evolved in a manner similar to that of many other attendees.

One day an old friend stopped by to visit. I hadn't seen him for a long time. But somehow, he seemed very different. He was far more open and interested in me as a person than before.

He told me his life had changed: he'd never been so happy; he'd never made so much money before nor felt so successful. He attributed all this to his experience at a self-awareness seminar. If he had five days to live over again, he said, it would be the days he spent at that session.

Quite honestly, it may sound crass to you, but I enrolled because I thought it would be great to make a lot of money and enjoy five days so much as to want to live them over.

Let me focus on my perceptions of DPers over the course of the seminar. As I said last week, it has been my experience that DP people are particularly amenable to stereotyping. Well, I proved this to myself again.

### DPers Discovered

When the training session began, we only used our first names and did not discuss our professions. However, early on, after I observed the other attendees participating in the exercises, I strongly suspected particular ones must be computer people. Later on, I found I was right.

The reason for my judgment was that these people uniformly spoke quietly, coldly and deliberately, probably only after long moments of reflection and analysis.

Another commonality was their seemingly lifeless expressions as they talked about or listened to very exciting situations.

I initially thought, "Good grief! If they are really computer people, we're going to have to wait while they go through all that analyzing."

I was surprised they would come to the seminar at all — that they had any willingness to communicate about themselves and others in open, human ways or to learn how. Heaven knows, if there is one group that needs help dealing with others in a feeling kind of way, it is computer people.

The seminar I attended gave us opportunities to see ourselves and others in new ways. Everyone there grew in his ability to understand his own feelings and relate them to others. Each person was able to accomplish this only after he recognized his needs are the same as those of everyone else.

The attendees began to express their real feelings to others in the group. It was easy to do this because the entire group gave its wholehearted support. Frankly, it was a most thrilling experience.

The progress made by the computer people was particularly impressive. Their faces became alive; their voices strengthened; their gestures became more animated and relaxed; they even exhibited a great deal of warmth. For the first time, I saw love in the face of a computer person!

*Joan Hendrickson is a copresident of the Georgetown Connection of Washington, D.C.*

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## The Taylor Report

# Better Guarantee Needed In NCR's Agreement

**By Alan Taylor**
Special to CW

Contracts of any kind should be clear, and the NCR Corp. universal contract is not. The letter of Ben E. Olive, NCR's associate general counsel [CW, Oct. 30] misrepresented the terms of the Universal Agreement.

Olive said: "The Universal Agreement states very clearly (except possibly to Taylor) that upon resale, the customer can transfer the software if a second owner agrees to protect NCR's legitimate proprietary rights and trade secrets."

Unfortunately Olive leaves out some vital, prior conditions. This is what it says in my copy:

"In the event that customer desires to sell purchased equipment to a third party, customer may not transfer or provide such data or material to the purchaser from customer without the prior agreement of NCR, which shall be granted if, and only if, the purchaser:

1. "Shall have agreed in writing that it will retain such in confidence to the same extent as provided in this section 10.

2. "Agrees to the continued payment of periodic license fees and/or the payment of any relicense fee in effect at the time of the transfer.

"NCR shall also have and may accumulatively exercise such further rights as it might have at law or in equity in such cases."

### Prior Permission Vital

For example, NCR Customer A has some equipment he wishes to sell to potential Buyer B. Can he include the firmware in the sale? Clearly, not. That would be a "transfer" of the firmware without NCR's prior permission.

As NCR will agree "if and only if" prior permission is obtained, the fact that Buyer B is prepared to sign those NCR papers means nothing. NCR can, if it chooses under the last sentence of the quoted clause, seek an equity injunction against Buyer B from using the firmware. I think NCR would win, too.

Permission from NCR is therefore vital prior to transfer.

Olive also forgot to tell CW readers about the possibility of relicense fees and when they are computed. Therein lies the next "Catch-22" trap in the Universal Agreement.

After receiving the application for transfer permission, NCR can change the license fee. It can then send out its own salesmen, who can offer equipment cheaper to Buyer B. (There is nothing in the Universal Agreement that states NCR will only sell equipment at list price.)

Imagine that on Dec. 1, NCR Customer A agrees to sell some three-year-old equipment, with a list price of $100,000, to Buyer B for $50,000 with the transfer to take place on Jan. 1.

Buyer B agrees in writing to pay the relicense fee on the equipment, and the agreement is sent to NCR, where it lands on Olive's desk. It might then be sent to the product manager or some other "line" person who realizes some-

(Continued on Page 22)

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## White Hat, Black Hat

# IBM Technology Goodies Coming Out of Closet

**By Herb Grosch**
Special to CW

For some years, IBM watchers have been divided on the tremendously important question of Armonk's commitment to advanced technology. We all read and recited the expenditures for R&D announced each year in corporate documents. And we believed them.

In fact, I've always felt much of software development cost is excluded from the figures in the IBM Annual Report and the total R&D expenditure is now close to $2 billion a year.

It depends on how one views the writing of programs: is it "production"? Or is production the duplication of the program and documentation for distribution to customers? If you buy the latter idea, then writing the awful stuff is development and huge additions to the corporate figures are necessary.

But anyhow, give or take a few hundred million a year (say, Hitachi Ltd.'s total annual computer sales), the Grim Gray Giant is spending nearly 10% of income for futures. The question was, lacking the Messianic leadership of Watson Senior and the courage of The Two Yachtsmen, would IBM ever let us see the results of all that research?

Somewhere in an infinity of back rooms in Yorktown Heights and San Jose and La Gaude and Boblingen, there were superchips, charge-coupled devices (CCD), bubbles and tiny holograms, optical fibers and bicycle-powered receiving antennas and weird languages undreamed of by Cobol customers. But would they ever emerge?

I claimed they would, when the marketing climate was right. I pointed to the innards of the 5100 desktop computer that depended on an unpublicized 48K chip assembly for its dumb Basic and its curious APL. That was in mass production years ago — about two chip-generations back, when the Motorolas and the Fairchilds were still having trouble with their 4K chippery. There were hints of microcode advances and, of course, the obvious necessities of the new Satellite Business Systems adventures.

### Other Outlooks

Others thought the old pattern of innovation and customer-trampling, which climaxed at the 360 announcement in 1964, would never be repeated. They pointed to repeated promises from Frank Cary and lesser breeds that the bucket would not be brutally kicked over as Vin Learson had ordered in that fateful year.

They pointed to my own old argument that IBM was the only one of the major computer firms that would lose gross business if it introduced much more bang for a buck — that is, it was the only firm for which an increase in market share could not be large enough to offset a reduction in income from its current customers.

*Touche!* But I had usually gone on to say that this meant more layers of even gummier software

(Continued on Page 24)

# DP Industry Should Back Larger Zip Code

**By Van H. Seagraves**
Special to CW

The negative editorial reaction [CW, Oct. 9] to the U.S. Postal Service's plans for adding four additional digits to the Zip Code came as a surprise.

It was startling because I cannot imagine that a publication covering one of America's most creative and fastest growing industries should focus on programming problems instead of how the computer industry can meet this challenge and help the mailing industries reduce costs.

The Postal Service has stated that by 1981 it expects to establish systems for the new Zip Code program. And, by 1983 we anticipate that customers will be voluntarily adding the numbers to their mailing address and that our optical character readers will be distributing mail to carrier routes.

This meens that DP managers have four years in which to rewrite programs, develop formats and make the other changes the expanded Zip Code will require.

I suspect that in most organizations a number of changes will be made in programs to accommodate new forms, fresh data requirements and other needs of menagement. Persons responsible for lerge mailing lists tell me that with four years of lead time they won't have a bit of trouble including the expanded Zip Code in their programs. They do not feel the conversion costs will be significant.

These meiling industry managers understand the limitations of our present Zip Code and the costs of manually keying or sorting each letter many times as it travels along the mail stream.

## Reader Commentary

A large percentage of the 55 billion pieces of letter mail handled yearly has computer-generated addresses or are preprinted reply envelopes. This is the primary "market" for the expanded Zip Code.

With the full Zip Code, optical charecter readers will be able to sort letters at a high speed right down to letter cerrier routes and box sections.

Todey's Zip Code does not permit such a fine sortation. It is costly for us to train clerks to memorize the specific blocks and sides of street served by each carrier. And, it is expensive for those mailing industries which maintain addresses by carrier routes to change their schemes when the Postal Service adjusts boundaries of the routes.

The expanded Zip Code will give the computer industry enother opportunity to demonstrate how it can increase the efficiency with which mail is delivered and hold the line on escalating postal rates.

*Seogroves is editor of the U.S. Postol Service's "Memo to Moilers."*

# Contract Needs Better Guarantees

*(Continued from Poge 21)*

one is willing to pey $50,000 for three-year-old equipment.

Off goes the NCR salesman to see Buyer B. Now the salesman can offer firm delivery. NCR Customer A cannot; he has to wait until NCR gets around to approving the transfer.

Nothing in the Universal Agreement says this approval must be given in 10 days, in a month or in any specific time. The NCR lawyers left out that important figure, just as they left out of the agreement many other customer protection features.

By delaying, NCR can force a renegotiation between the parties that may contribute to the stoppage of the deal.

Meanwhile, the NCR salesman can offer cut prices, firm delivery and intermediate backup. He might also tell Buyer B that if he keeps his old agreement, he won't know until after the trensfer occurs what the total cost will be since NCR can introduce e relicense fee.

**Relicense Fee Danger**

Suppose the "Director of Price Changes" sends out a memo on Dec. 31 that the relicense fee for the equipment is 75% of the $100,000 list price. Meanwhile, the transfer between NCR Customer A and Buyer B takes place.

NCR can then proceed in law and equity against Buyer B for $75,000 under the terms of the quoted clause of the agreement, if the software is included in that transfer on Jan. 1. Again, I think NCR would win its claim against Buyer B.

I find it disconcerting that at this point it appears NCR will go to court rather than to an arbitrator. Most arbitrators I know would not like to receive a signed agreement for payment of some unknowable fee, but the judicial system proceeds on the idea that people *mean* what they sign.

Keep in mind that NCR can drop its equipment price fairly low. Even if the equipment were brand new, the actual cost of producing that equipment is 20% below list price.

The real issue now is whether NCR, after instructing its lawyers to say that anyone can transfer equipment without its good will, will live up to this expectation. This would entail changing its universal contract to provide the user with more substantiel guarantees, including the promise that NCR will not destroy the value to its customers of the purchased equipment.

After sending the letter to *Computerworld*, NCR mey find it appropriate to at least show me in black and white where these guerantees are and how they are superior to most others.

I have en idea. Let's get together — with the meeting properly recorded — to discuss whet the Universal Agreement says now and what is needed to give NCR customers the rights the company obviously wants them to have.

As it stands, the Universal Agreement certainly does not make those rights clear.

Let's set a dete for publishing a new universal agreement with the customers' rights written clearly and boldly into it.

I would suggest a new section sterting, "Notwithstanding enything written elsewhere in this agreement, NCR guarantees customers the right to resell equipment, to never make a move to hurt the value of such equipment — or threaten to do so — by restricting maintenance contracts, spere part supplies, firmware or by informing its sales force of the identity of prospective buyers . . ."

How about it, NCR? When and where shell we meet? How ebout New York — but not Buffalo — Syrecuse is about halfway between us, so why not there?

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## Reader Commentary

## Common Communications Barrier

# DPers Caught Up in Third Party Syndrome

**By Jim Ryan**
Special to CW

We are all familiar with the problem of making contact by telephone. The probability of directly reaching even a minor executive is quite low — in fact, almost nonexistent.

Usually we are greeted by a secretary, receptionist or switchboard operator and we begin the guessing game as to how much time we should waste in establishing communication. In the worst case, the party at the other end encourages discussion only to inform you after an extensive conversation that they cannot help and that they will have their party call you back as soon as possible.

A second situation is that of the level-conscious executive who carefully instructs a secretary on the protocol to be followed if and when the other party is on the line: This could be ludicrous if it weren't such a tragic waste of time.

Both of these cases are examples of the "third party syndrome" in which direct contact between two people is confused or delayed by a third party.

The above cases are only minor nuisance conditions and most of us have learned to live with them. However, there are real problems associated with the syndrome and they often involve computers and DPers.

The problem is more apparent if we think in terms of the ultimate consumers as they relate to the providers of a service or product. Under these conditions, computers and DPers are nearly always the third party.

The only exception is in those cases where the consumer actually defines the problem, obtains the necessary hardware, writes the software and operates the machine to obtain the desired output.

This usually applies only to either very simple applications or to mathematical problems. In all other cases, teams of specialists are required to bridge the gap between provides and consumers.

### Reason for Complexity

This complex arrangement has become necessary because of the high level of DP technology required in today's industries and government agencies. When it works well, it is a highly efficient operation capable of processing many applications at very low cost. When it works poorly, all of the horrors associated with the third party syndrome become painfully apparent.

It has reached such proportions today that many people actually weigh the time and effort to obtain satisfaction on a given complaint against the probable result, then give up the chase and accept their losses or dissatisfaction as the price to be paid for modern living.

This is in spite of the fact that many large organizations have realized they will ultimately fail if they do not serve their customers well. They have set up all kinds of direct contacts for consumers including high priority to letters addressed to the President and special consumer advocates.

Even with all of these special arrangements, we still find newspapers providing special columns to solve customers' problems because of the ineffectiveness of direct contact.

In many cases, the reason both the consumer and the consumer advocate give up in despair when a computer is involved is because they do not know how to work with computers or DPers. They have no conception of the process involved in the input, processing and output of information. At the very best, they can operate a CRT device that will tell them the status of a situation, but in only a few cases can the consumer advocate cause any changes. The ultimate consumer is never allowed access to a computer.

Our DP friends will justify this position quite correctly by saying that inexperienced people, given access to a computer, can create havoc in a very short time.

### Frustration Remains

The problem, however, remains and the consumer continues to be frustrated as soon as the word computer is mentioned. Unfortunately the consumer's complaint is also justified because often it takes months and large amounts of verbal and written communication to resolve a computer problem which is actually not the fault of the computer itself, but is the result of faulty input information.

The answer seems to be a requirement for a new generation of consumer advocate people who understand the principles of computer operations so that they know how to cause changes in the DP systems.

To protect the integrity of a computer process, it will always be necessary for the DP center to have absolute control over the computer system, but the difference should be that the consumer or consumer advocate should have more access to, and the ability to communicate intelligently with, the DP center.

The present "Keep Out" signs on computer rooms have denied any kind of access by the consumer or the consumer advocate. This has created a mental attitude on the part of many DPers that must be changed if the consumer is to be able to communicate with them. The consumer must also be taught how to phrase the proper questions at the proper time if contact is to be made.

At the present time, a number of service-oriented organizations have at least partially implemented this concept. It is a great pleasure to write or call a corporation or government agency and have the first contact be a person who will accept a complaint and follow it through to the customer's satisfaction no matter how many departments or computers are involved.

A satisfied consumer will accept the need for one complaint, but the constant time-consuming frustration of repeated complaints on the same problem is what ultimately turns the consumer off.

### Odd State of Affairs

It seems odd that at a time when most organizations are concerned about their public images, more time and effort is not being devoted to that very important consumer who ultimately will determine the image of any organization.

All executives would do well to test their operation periodically by taking a letter or telephone complaint and, assuming the customer's status, proceed to take the same course of action as the consumer was required to take, to determine exactly what happened. It might be a surprising experience; at least it would tell how a message from the top appears when it hits the firing line.

Too often, the executive takes a complaint and assigns its solution to a staff person who solves the problem using all of the authority of the executive. About all this does is to bolster the executive's ego.

In a well-run, service-oriented organization, the executive will find that the firing line people are in fact doing a good job and that the consumer may actually be at fault.

If, however, a problem does surface, the executive should not immediately dismiss the person on the firing line. Many times the firing line has not been provided with the proper training or authority to solve the problem and it must be booted upstairs for answers, which indicates that authority has not been properly delegated.

For some vague reason, it seems that problems that are solved from the top down get more attention and better solutions than those being solved from the bottom up.

In any event, the third party syndrome is with us and must continue to remain with us in a complex society. It is present in all organizations, but the more there is of it the less effective the organization becomes.

*Ryan is a retired DP user.*

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# IBM Bringing Advances Out of Its Laboratories

*(Continued from Page 21)*

to reduce the effectiveness of radical new technology to an acceptably low level. The same ingenuity that produces a laser printer can produce Napoleon MVS (alternate layers of custard and crust)!

Anyhow, the argument is now resolved. The announcements of the last few weeks show that IBM is willing to unleash some of its laboratory miracles. We see promised mass production in major and complex systems and of 64K chips and 256K chip packages. And we see it from both of those increasingly competitive divisions, the Data Processing Division and the General Systems Division, indicating a common utilization of advanced materiel and clear management support from the Golden Boys upstairs.

My guess is that as customers and competitors poke around in the new 8100s and 38s, in the flood of new products coming in the next 12 months and as professionals and media people digest the information and announcements, dozens of high-technology novelties will surface. I expect whole new subsystems, notably a response to the recent CCD disk replacement offered by Storage Technology Corp.

The situation is very different from 1964, when an enormous number of new boxes all depended on a single component advance — the ceramic substrate with its three or four transistor-equivalents and the Fishkill factory that was first able to turn it out. Today there are a dozen novel phenomena in the IBM locker, from wall-domain magnetic bubbles to Josephson junctions. Since the 360, IBM has spent a fortune in its laboratories and development shops. The time has clearly arrived for us to see the practical results.

### Why Now?

Why 1978 and 1979? Well, I'd point to a convergence of several influences. The internal pressures have mounted; having invented new machinery and new languages, the developers want to see them used; having become bored with the 370 and with System/3, the sales force calls for something fresh to peddle.

Then there is mounting competition, especially from the compatible mainframers — Amdahl Corp., Fujitsu Ltd., Itel Corp. and Hitachi. There is announcement of replacement operating systems, notably the huge one by Fujitsu. There is the Pascal enthusiasm and the enticing horrors of the new DOD language.

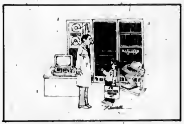
Above all, there is that other supergiant, Ma Bell. Since you have to go over telephone copper (or microwave, or optical fibers) to get to a bigger computer, why not let The Immortal System handle the whole job — direct the request wherever optimum facilities and availabilities indicate, with perfect compatibility and transparency? Now, there is a real threat! Down inside those impregnable Bell fortresses, the CPUs may well be Amdahl Corp. or Cray or — curses! — even Western Electric Co.

And finally, it's time. There is a genuine rhythm to any system, whether chip generations (two years), necktie widths, the sunspot cycle or airline luxury. The 360/370 basic architecture may well be immutable, as a recent *Computerworld* lead editorial (Oct. 23) claimed. But that structure is now so far down below layers of operating systems, job entry languages and specialist software, and masked by networking and multiplexing, that change can again occur, according to the fundamental mainframe cycle of what I now hold to be 12 or 14 years: from the early Twenties to 1938 for the old black punched card machines, from 1938 to 1950 for the relay machines and on-off tube experiments, from 1950 to 1964 for the long-word-length, single component systems and from 1964 to right about now for the Byte Generation.

Microprocessors and even minis may have a different rhythm, but it is much too soon to tell. But I doubt it, because the fundamental pulse is that of human impatience and human inventiveness modulated somewhat by economics. We see it in air transport, we see it in skirt lengths and we're surrounded by it in computer art.

So IBM innovation has come out of the closet. For customers, especially large customers, the next year or so will be a time of frantic reassessment — a time of new balances between IBM, the Bell System, the other mainframers, the Kompatibility Kids, the Peripheral People, the Distributed Devotees and the language fanatics.

The latest Japanese releases indicate the gap between Fujitsu and Hitachi, and Burroughs Corp., Control Data Corp. and Univac has closed. But the recent announcements and the sounds of the north wind rising against the mountains tell us IBM is still strong, agile and full of surprises. And they tell us many of those surprises will be couched in high technology.



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### And Enhances 'Com-Plete'

# Software AG Offers Dial-Up Debugging

**By Don Leavitt**
CW Staff

RESTON, Va. — Substantial, individualized technical support for software — similar in concept to facilities that vendors like IBM and Amdahl Corp. have touted for hardware maintenance — is now being offered users of Com-Plete, the teleprocessing and program development system, or Adabas, the data base management system, from Software AG.

Under the Instant On-Site Support plan, immediate technical assistance is available to Com-Plete or Adabas sites that provide a dial-up teletypewriter port on their IBM 370X or compatible transmission control unit, a spokesman said.

Virtually any software problem can be resolved quickly, without actual on-site assistance, through this facility, he said, noting that it allows the very best technician Software AG has available, regardless of where he might be, to go to work on the problem as if he were in fact at the user's installation.

The vendor technician can examine memory, memory dumps, JCL, user programs, control blocks, system queues — and, obviously, Com-Plete or Adabas code — from any location at which he has a terminal. Thus, debugging can get under way without delays caused by shipping memory dumps to some central location, the spokesman noted.

Security is provided to prevent unauthorized access to the user's data while it is reviewed under Instant On-Site Support, he added.

(This terminal-oriented software support appears to be directly comparable to one of the facilities available to users, software firms and consultants with CAP Microsoft's Viewdata Terminal Program (VTP) to ease the interchange of messages, programs and data on the British Post Office Viewdata service [CW, Nov. 13].)

### Enhanced 'Com-Plete'

The announcement of the dial-up maintenance coincided with Software AG's introduction of Version 3 of Com-Plete, which contains many enhancements in addition to Instant On-Site Support.

The update allows Com-Plete users to access Vsam data sets in native mode; there is no need for special CALLs from on-line programs, the spokesman said. The application program can simply code standard batch requests to get Vsam data from terminal-oriented runs, he went on.

*(Continued on Page 26)*

# 'Words' Backs Distributors

HUNTINGTON BEACH, Calif. — An inventory management system that reportedly combines the multiple aspects of the distribution industry into an integrated process, the Wyle On-Line Real-Time Distribution System (Words) software is available from Wyle Data Services for use on IBM 370s.

The system has been perfected during five years of operation in support of the distribution group of Wyle Laboratories, which is involved in the electronics industry, according to a spokesman. But Words should work just as well in other distribution operations including, for example, the automotive, electrical, and grocery industries, he added.

The software was designed for use in a highly volatile sales environment, he said, and it provides a "full complement" of operational advantages.

Words uses the latest developments in real-time processing to link multiple warehouse locations and to provide immediate access to inventory, sales orders, purchase orders and accounting data, the spokesman said.

He emphasized that Words is not the answer to every installation's needs. It would be a poor choice for a manufacturer, for example, since it does not include such basic facilities — for that user — as a bill of materials processor.

But the integration of the modules — the system includes about 150 programs, 50 of which are on-line — "brings together the most needed aspects of inventory management in one package [which should increase user] profitability through efficient work flow processing and minimize lost sales from dissatisfied customers," he claimed.

Written predominantly in BAL for use under DOS/VS on a 512K 370/138 or larger CPU with 400M bytes of disk space, four tape drives and a printer in addition to teleprocessing facilities, source code for Words can be acquired for "somewhere between $200,000 and $300,000," depending on the amount of installation support Wyle has to provide.

Ultimately, the price is negotiable, the spokesman said from 15302 Bolsa Chica Ave., Huntington Beach, Calif. 92647.

# Work on Pascal Progressing

WASHINGTON, D.C. — The proposal to set a standard for the Pascal language [CW, Aug. 28] has struck a responsive chord within the American National Standards Institute (Ansi). A technical committee on Pascal has been approved to work under the X3 committee on computers and information processing.

Identified as X3J9, the new group's initial task is to prepare a proposal for standardization of Pascal and to obtain approval of the proposal, including a program of work to implement the proposal, from X3, according to X3 secretary William F. Hanrahan.

Committeee work will be aligned closely with various international efforts on behalf of standardizing the language, as well as with ongoing work in the U.S. federal government, domestic professional societies, equipment manufacturers and other interested parties, he said.

X3 has named Justin Walker of the National Bureau of Standards as the convener of X3J9's first meeting, currently scheduled for Tuesday morning, Dec. 19, at the offices of the Computer and Business Equipment Manufacturers Association (Cbema).

The committee is seeking active participation from users as well as developers of Pascal compilers. A permanent chairman will be elected out of those attending the December meeting, Hanrahan noted.

Interested people and organizational representatives are invited to contact Cathy A. Kachurik at Cbema/Standards, 1828 L St. N.W., Washington, D.C. 20036.

## *Looking for Views On Packages*

*Computerworld* will publish a special report on application packages in January and, to make it as useful as possible, would welcome articles contributed by users outlining their experiences with packages and vendors.

Some installations still don't know what benefits to expect, realistically, from packages; how to check out what is available before they buy; what kind of problems they may encounter trying to install a package; or what kind of help they might get from the vendor.

These are the points the report will try to cover. Users can help with manuscripts limited to about 1,000 words (four typed, double-spaced pages). Please submit them by Dec. 20 to Don Leavitt, *Computerworld*, 797 Washington St., Newton, Mass. 02160.

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# Software AG Adds Support For Users of 'Adabas,' 'Com-Plete'

(Continued from Page 25)

Version 3 also provides for larger thread sizes — up to 252K bytes — and performance enhancements for thread balancing and rollin/rollout management of tasks. Thread scheduling is based on activity rather than users or terminals assigned to the thread.

OS SPIE and SYSOUT support under Version 3 is said to provide additional debugging support for high-level languages. This facility allows ON CONDITION clauses in PL/I and DISPLAY, TRACE and EXHIBIT verbs in Cobol to be coded in on-line applications with appropriate handling of SYSOUT and SYSPRINT data sets, according to the spokesman.

Ten distinct message significance levels are provided in the Com-Plete update as well as new facilities for "cold," "warm" and "hot" restart of message switching and printout spooling, he said.

Com-Plete currently runs under OS-MFT or MVT, OS/VS1 and OS/SVS. It costs $60,000 but will go up to $90,000 as of Jan. 1.

Adabas users who do not have Com-Plete but would like the Instant On-Site Support for the DBMS can get it for an installation charge of $2,000 and $350/mo rental, payable annually.

The support is built into the updated version of Com-Plete, the spokesman reiterated from 11800 Sunrise Valley Drive, Reston, Va. 22091.

# Hill Book Updated

BLUE BELL, Pa. — An updated, corrected and retypeset version of *The World of EDP Standards*, originally written by Margory Hill and published by Control Data Corp., has been prepared by Univac.

This is the third version of Hill's book, according to a spokesman for the American National Standards Institute. Hill's original edition, bound in red, was released in 1972. An updating effort by the National Bureau of Standards, in cooperation with CDC, resulted in 1976 in a blue-covered edition that suffered from "numerous errors and illegible material," Ansi said.

The latest update, costs $5 a copy, with quantity discounts available, from Director of Standards, Sperry Univac, MS C1-NE5, P.O. Box 500, Blue Bell, Pa. 19424.

# Three Books List Programs In Basic

NORWALK, Conn. — The Standard Software Library is a series of books containing listings of programs written in Basic with complete documentation, published by Creative Computer Consultants, Inc.

Each volume in the series is devoted to a single application and the first three focus on accounting problems for small computers, according to a spokesman. These include general ledger (Volume 1), accounts payable (Volume 2) and payroll (Volume 3), he added.

All the programs were written in a level of Basic common to "practically all" current mini- and microcomputers, he said, and make it easy to make changes to fit special needs.

For each program, documentation includes an overview of its logic, a list of variables used, a description of required inputs and an illustrative example of the outputs generated. Comments are contained in all the programs.

Volume 1 costs $49.95 and should be available soon at computer stores throughout the country. It can also be ordered directly from Creative Computer Consultants, Inc., P.O. Box 2111, Norwalk, Conn. 06852.

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ITEL

# *On-Line Executive Runs on NCR CPUs*

PLEASANT HILL, Calif. — Basic On-Line Support System 3 (Boss/3), an on-line executive, has been released by Century Analysis, Inc. to provide users of NCR Corp. Century 101 and larger CPUs with interactive processing and data entry capabilities.

The software was designed to provide an on-line system that can be developed by batch-oriented programmers, that enables the key entry responsibility to be returned to the user departments and whose cost can be offset by replacing existing data entry equipment, a spokesman explained.

Boss/3 includes one subsystem that supports all data entry functions — enter, verify, search and modify.

A second subsystem supports all CRT screen building functions and provides communications and file handling functions at a macro level. Taken together, the two subsystems enable the user to handle all modes of on-line operation, the spokesman claimed.

The package can be used on an NCR 101 or more powerful CPU with 45K of main memory plus 2K for every data entry terminal, "at least" 2K for each interactive terminal and space for file buffers, he said.

Boss/3 prices start at $11,000; an interface to run under VRX costs an additional $2,000 and a message-switching/broadcast faciliity is another $1,000.

Century Analysis, Inc. is at 3343 Vincent Road, Pleasant Hill, Calif. 94523.

[redacted]

# UCC Updates File System For Banks

DALLAS — Version 5.3 of University Computing Co.'s Customer Information File System (UCC/CIF) provides for the development and maintenance of a multi-institutional multibranch cross-referenced central file for customer and account information and is generally intended for the banking environment.

Using a total system approach, the package gives its users a complete "scrubbing" series to prepare user files, customer key grading and selection prior to loading on-line files and versatility to permit ongoing application maintenance, a spokeswoman said.

Version 5.3's significant enhancements include a simplification to the conversion process, she noted. New programs can be added to analyze the user extract file and predict which words should be included in the format tables to achieve the best standardization of all incoming names and addresses.

Version 5.3 makes UCC/CIF on-line functions screen-size-independent. Error screen displays have been formatted to give more meaningful descriptions of error situations and users can tailor these messages, the spokeswoman continued.

The extended file inquiry added to Version 5.3 also provides inquiries that selectively list account cross-references, total balance data, display customer cross-reference data and display account data housed in the UCC/CIF subfiles.

UCC/CIF has been used in an OS/MVT environment on an IBM 360/65, utilizing UCC's data communications system, and in a DOS/VS setting with CICS on a 370/165.

UCC/CIF is modularly priced depending on operating system environment, including DOS, OS or IMS. It costs $25,000 to $72,000 depending on modules selected and is available from 8303 Elmbrook, P.O. Box 47911, Dallas, Texas 75247.

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# DP Dialogue

Notes and observations from IBM
that may prove of interest to
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## Users Take System Development Lead at Hartford National Bank

*At Hartford National Bank, users of data processing services now work closely with the application development staff. These managers are alumni of an IBM course in "Project Planning and Control for Users."*

With competitive pressures and a volatile marketplace, the Hartford National Bank and Trust Company, Connecticut, must get new computer applications up and running fast. The involvement of users in the development process, and their ability to communicate with programmers and analysts, are both vital to meeting that need. Recently, managers of three departments at the bank that use DP services attended an IBM course, "Project Planning and Control for Users," that teaches users how to define and specify a computer application and share in control of its development.

"Today we spend much more time in the design phase of a project," says James Lenehan. "At first, we were concerned because we were expending more manhours before actual coding started. But with clear definition of the problem and continuous user participation, we needed much less time for test and signoff at the end, and we've been meeting our target dates."

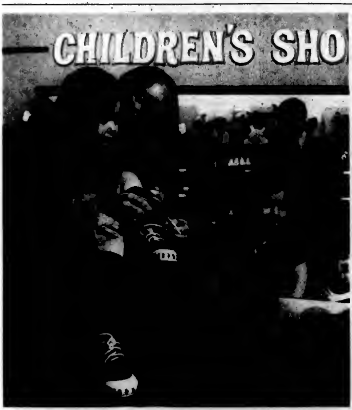
Lenehan is system development officer of the bank, the second largest in New England. Hartford National operates two IBM System/370 Model 158's, one with an Attached Processor. It has 65 applications scheduled for development this year.

One attendee, Richard Dennison, loan administration operations officer, reports: "We used the techniques taught in the course on a major online inquiry enhancement. In previous years, the first time we saw the programmer's interpretation of what was wanted was during quality assurance testing. Programs often needed twice the estimated amount of maintenance because we hadn't been able to define our requirements beforehand. With the IBM course under our belts, we users can participate in the design. We knew what we were getting before the system was installed, and we're pleased with it."

Philip Patrone, manager of trust accounting operations, agrees: "As a user who spends a great deal each year on development, I must take an active role in design. Today we speak the same language as the systems people. They meet their schedules, and the system we specify is the system they install."

According to Ken Klieback, manager of retail deposit operations, "when Marketing develops a new idea for a deposit account, we need the computer support for it installed fast, and the Project Planning course has been a big help. Recently we installed two new applications with only two or three days of testing.

"Among other things, the IBM course showed us how to communicate about systems. With the response I now get from the development people, I feel more like a customer in a business relationship."



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Financial planners at Kinney Shoe Corporation project capital requirements for the opening of 180 new stores a year. Each new store is a substantial capital venture in itself, involving interior design and construction, contracting fur space, assembling an inventory, and adding or transferring a staff of people.

With the aid of an IBM program called A Departmental Reporting System (ADRS), Kinney planners can revise their projections quickly and as often as needed to accommodate schedule changes.

"We need to know what will happen to our capital requirements if we add a few stores to the schedule, or postpone one opening from the first to the third quarter," says Selig Adler, budget director for the major New York City-based shoe merchandiser, with 1600 retail stores across the U.S.

"To get the answers, we enter variable data through a computer terminal," Adler explains. "Ultimately the system will automatically pick up a large mass of basic fixed data, such as construction costs and pay rates, and perform the repetitive calculations. If we need to change the schedule of store openings – or just want to evaluate the effects of a proposed change – we can key in a new capital spending plan and get a revised printout of our financial plan in moments."

Adler and his fellow financial executives interact directly with an IBM System/370 Model 158 computer, using simple English-like commands to specify the desired reports and tables.

With ADRS, Adler is also able to develop detailed financial plans, weekly sales reports on Kinney and its competition, projections of sales and profit derived from past and present operating data, and other reports used by Kinney's top management in making operating decisions.

"Now I do a lot less pencil-pushing," Adler adds. "I can concentrate on what goes into a projection, and if something doesn't look right, I have time to decide which input needs changing. Often, I had to live with the first result because of time pressure. Now I can make last-minute revisions and get much better forecasts."

Says senior vice president Thomas E. Page: "We write these applications ourselves using ADRS, so we have them in days instead of months. Our planning documents are modified constantly as our needs change, or when management wants financial projections in more detail or differently organized. Now we can revise a format on the spot and obtain a new printed copy promptly. Kinney gets better information sooner and makes decisions on a more meaningful basis."

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*DP Dialogue is designed to provide you with useful information about data processing applications, concepts and techniques. For more information about IBM products or services, contact your local IBM branch office, or write Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.*

IBM
DATA PROCESSING DIVISION

# Meet to Deal With Specifications

SILVER SPRINGS, Md. — The importance of developing detailed specifications during the early phases of software lifecycles is the topic of a conference to be held in Cambridge, Mass. in April.

Fifteen papers have already been submitted, ranging from a discussion of formal specification languages to speculations on the direction of future research, according to program chairman Marvin Zelkowitz of the University of Maryland.

A few papers "have trickled in" since the Nov. 1 deadline and two or three more are expected, he said, adding that authors will be notified of acceptance or rejection of their papers on or after Dec. 15.

The conference, described as "the first and probably the last of its kind," is sponsored by the Institute of Electrical and Electronics Engineers, Inc.'s (IEEE) Technical Committee on Software Engineering in cooperation with the Association for Computer Machinery (ACM), Zelkowitz said.

The idea for the conference germinated from the need to examine and identify reliable software products and will most likely concentrate on a user's need to verify the consistency and completeness of specifications.

Although plans for the sessions are going along smoothly, Zelkowitz admitted the conference presently lacks any definite symposium on user experiences.The planning board had hoped to incorporate panel discussions on actual case histories but will probably have to forego this because of a lack of interested participants.

Additional information on the specifications conference and a complete advance program can be obtained from the conference director, P.O. Box 639, Silver Springs, Md.

# Data Base Future Examined

MAIDENHEAD, England — A decision to "go data base" usually involves a 10-year investment in systems, software and staff, yet imminent technological developments could make existing data base systems obsolete, according to a spokesman for Infotech International Ltd.

To provide users and potential users of data base systems with at least a guide to that area of software, Infotech has recently published one of its State-of-the-Art reports entitled "Data Base Technology."

In the book, a panel of international consultants examines the immediate future for data base management systems, assesses the practical effects of forthcoming developments and suggests steps that can be taken now to benefit, rather than suffer, from new technology, the spokesman explained.

The two volume, 840-page publication is available outside the U.S. for 120 British pounds, from Infotech International Ltd., Nicholson House, Maidenhead, Berks, SL6 1LD, England. In the U.S., the book is available for $260 from Auerbach Publishers, Inc., 6560 N. Park Drive, Pennsauken, N.J. 08109.

# Self-Study Courses Offered

WELLESLEY, Mass. — Under terms of an agreement with John Wiley and Sons, Inc., QED Information Sciences has acquired rights to distribute selected courses from Wiley's Professional Development Program to the DP community.

The courses selected include How to Develop Dynamic Leadership, How to Manage People at Work, Effective Presentation, Successful Writing, Managerial Accounting and two courses in Modern Production Accounting, a QED spokesman said.

These choices are particularly relevant to DP professionals, he claimed, since the first four are directed at specialists who have reached management positions because of technical; not management, skills and the last two providehelp to analysts and designers in dealing with the business world.

Each course costs $34.95 ($31.95 prepaid) and can be ordered from QED at P.O. Box 181, 141 Linden St., Wellesley, Mass. 02181.

# *PL/I Added To 'Test/IMS'*

SACRAMENTO, Calif.— Support for PL/I used as a host language (to go along with existing Assembler and Cobol capabilities) has been added to the Test/IMS package, according to the vendor, Software Module Marketing (SMM).

Developed by Chicago Data Systems, Inc., the package was described as a full-facility, on-line test system for IBM's IMS data base management system. It supports "session testing," allowing many different, possibly unrelated program errors to be identified in a single execution, a spokesman said.

It intercepts program checks that might otherwise lead to Abends and resolves them if it can, logging the changes made to simplify later debugging. It then continues the test run as if the program check had not occurred, he explained.

Test/IMS facilities include DL/1 CALL parameter verification, DL/1 status code checking and the printing of IMS and program interface information including I/O areas, teleprocessing and data base control blocks and a formatted hex and character memory dump, the spokesman continued.

Written in Cobol and assembler for use under OS or OS/VS, the package costs $12,000 from SMM in the Crocker Bank Building Penthouse, 1007 Seventh St., Sacramento, Calif. 95814.

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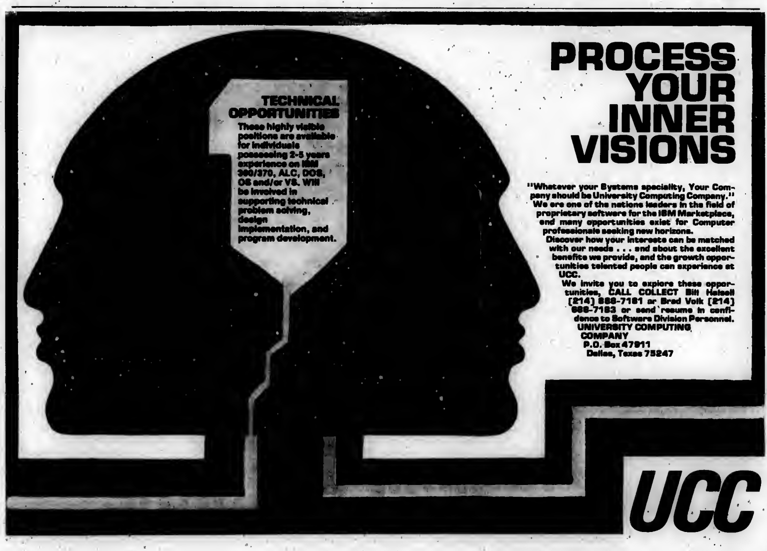

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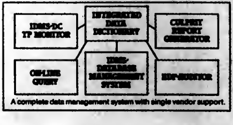

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# Researchers Face Special DBMS Design Needs

By Richard J. Trilling
Special to CW

Certain features of the research environment critically affect the design and selection of a data base management system (DBMS) and may make the application of a commercial DBMS risky or inappropriate. In fact, features of the research environment probably constitute a superset of the features of the commercial environment, so a DBMS designed to meet the needs of the latter may fail to satisfy the needs of the former.

The ideas presented in this paper have been developed while working under contract to the U.S. Environmental Protection Agency on its Cleans Clever project. This project was designed to determine the effects of toxicological air pollutants on human immunological and biochemical systems and physiological performance and involves thousands of variables and many megabytes of data.

Following are some essential design considerations:

- In the commercial environment, use of a data base usually involves extracting a subfile of cases that meet certain key criteria in order to enumerate those cases or retrieve their records. In the research environment, on the other hand, use of a data base usually involves extracting a subfile of cases that meet certain key criteria in order to analyze cause-effect relationships among other, nonkey variables.
- For a data base to support research, it should be flexible enough to answer any conceivable question the researcher might ask of the data. Any variable, in other words, may be used as a "key" variable, and any query may be followed with a query requiring a different set of variables.

A query may involve any combination of several thousand variables. Flexibility is essential because the choice of one query depends on the result of the previous query.

- Research data is worthless unless statistical analysis is possible. The data base must therefore permit statistical analysis either by being accessed directly by statistical routines or by permitting easy transfer of data to statistical routines. The statistical routines should be easy to use, understandable, reliable and statistically sophisticated.
- A wide variety of data types is to be expected in the research environment, including integer, floating point, character and perhaps also date and time.
- A wide variety of record formats is also to be expected, including specifically the possibility of repeating groups (multiple measurements).
- The nature of research is such that multiple versions of the data base may exist at any one moment in time. The evolution of the data base may change the numbers of cases or missing data used in analysis. Making these multiple versions must be easy, but keeping track of them and documenting them is of utmost importance. Conclusions based on one version of the data base must be replicable.

Unlike most commercial users who need only the latest value of a variable, research users must know at all times which versions of the data base are in existence at any moment in time; which version the user is using; how each version differs from all others; and which versions are associated with which published reports.

- Multiple algorithms may have been used to produce similar data. In fact, one purpose of the research may be to compare the algorithms. Redundancy may be a virtue, not a vice.
- Research data often resides within the public domain even though there may be a privacy contract that the subject's data not be revealed without the subject's permission.

As part of the public domain, the data in the data base must be accessible easily and reliably to any legitimate user. However, out-of-house users may request copies of the data base if the data are worthwhile and if the analysis is noteworthy.

It should be possible to make copies of the data base without considerable delay, cost or inconvenience. No request should be honored, however, which in any way tries to violate the privacy of subjects who participated in the project.

In general, access to the data base must be fast and easy, but must at all times be under close scrutiny.

- As in the commercial setting, different levels of access for different classes of users must be maintained even in the research setting.
- Integrity (data safety) is a vital concern with projects that generate data for the purpose of writing public law. Data must be protected against inadvertent or other tampering. Documented versions of the data base must be recoverable upon demand. Analyses must be replicable.

Note that in the research setting, integrity is of considerably more importance than is security, whereas in the commercial setting, integrity and security are probably of equal importance.

- Research data that constitutes an archive must be maintained, fully documented, updated and kept accessible not only to researchers in-house but also to outside researchers who may desire to answer specific research questions or engage in large-scale scientific research projects involving secondary analysis of the data.
- Interactive use of the data base would be especially beneficial for the researcher wishing to navigate through the data formulating or refining hypotheses along the way. This mode is not vital but nevertheless would eliminate the need to communicate with the data base through a computer programmer or to tolerate the delays of batch mode.
- A graphics capability would provide hard-copy evidence of distributions and relationships and, in interactive mode, would offer a tool to help the researcher determine whether the distributions and relationships discovered by navigating through the data base warrant further exploration.
- Standard utilities should be available to permit audits of transactions with the data

(Continued on Page 32)

# Package Aids Wang Users' Accounting

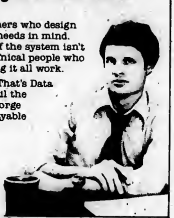
GRANTS PASS, Ore. — Users of Wang Laboratories, Inc. "T" and PCS II systems can now run their basic accounting work with a "high degree of user control and design" by utilizing the General Ledger 101 (G/L 101) package from Data Train, Inc. (DTI), according to a spokesman.

All necessary accounting reports and audit trails are included and the user may format the financial statements to meet internal or customer needs. The system provides balance sheets, comparative balance sheets, profit and loss statements, comparative profit and loss and change in financial position reports, he said.

The standard reports may contain up to eight columns of data, but special reports may be designed and generated through the package's report writer feature, the spokesman noted.

Typical limits on the Wang dual floppy-disk configuration currently supported are 2,000 monthly posted transactions with 500 general ledger accounts but the disbursement is under user control, the spokesman added.

Distributed in object code, G/L 100 costs $850 and is available from DTI at Suite 3, 840 N.W. Sixth St., Grants Pass, Ore. 97526.



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# *Datagraphix Enhances Package for COM Units*

SAN DIEGO, Calif. — Direct access file management capabilities and expanded job accounting functions are part of a computer output microfilm (COM) package released by Datagraphix, Inc. for its Mini-Autocom and System 4500 minicomputer-controlled recorders.

Release 9.0 of Miniform utilizes an Advanced COM Executive (Ace) which replaces the previous stand-alone monitor control program and adds direct access facilities. The user can still access files sequentially, a spokeswoman stated, but is encouraged to convert to direct access formats.

The COM package also contains two utility programs. One converts sequential files to direct access and the other uses direct access methods for file listing, copying, deleting and updating, the spokeswoman added.

Other features of the release include a multiple character size option a disk-oriented initial program autoload; an optional real-time clock; and the addition of two input tape reformatting modules.

Release 9.0 also incorporates a memory driver that allows storage of index keys or job accounting records in a reserved portion of memory and an expanded label processing capability.

The COM software enhancement is free to prospective users of the firm's minicomputer-controlled line of recorders as well as to present users who want to update their facilities.

Additional information and specifications are available from Datagraphix, Inc., P.O. Box 82449, San Diego, Calif. 92138.

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# Macrocompiler Suits NCR 8200, Other Small Systems Using Cobol

TULSA, Okla. — Written in ANS Cobol 74 for use on NCR Corp.'s interactive 8200 series of small business systems, a Cobol Macrocompiler developed by Brad Jensen, CDP, should be easily transportable to any other small system using Cobol, he said.

The Cobol support was built around the Fastbol precompiler Jensen created two years ago to reduce the amount of coding needed, by allowing use of abbreviations, for example, that were expanded into full Cobol statements before the program was to be compiled.

To that, the developer has added both a macro-instruction generator and a cross-reference facility. Macros are, generally speaking, single-line instructions including a verb and various parameters which tailor a previously developed section of code to the specific situation and then insert that code in the user's program where the macro was written.

Jensen claims several advantages accrue through the use of macros. First, they are quicker to use than conventional Cobol coding, and second, since they utilize logic that has been previously developed and presumably debugged, they avoid the problem of untested code, he said.

The developer also claimed that macros can be created by anyone who can write Cobol code and who can follow the instructions provided in the user manual.

Object code for the Cobol Macrocompiler system — the macro generator, Fastbol and Xref — for NCR's IMOS environment on 8200 and 8450 CPUs costs $750. A user manual is available separately for $25, which is refundable if the software is ordered.

Jensen can be reached at 1419 S. Quincy, P.O. Box 4159, Tulsa, Okla. 74104.

# Researchers' DBMS Needs Unique

*(Continued from Page 31)*

base; updating or editing of data in the data base; recovery from disasters; and of course altering the set of key variables available to the researcher for querying.

- A querying capability in an English-like language would enhance for the computer novice the research potential of the data base and in general facilitate the use of the data base.
- Interfaces of the DBMS with programming languages would be useful to permit more powerful manipulation of the data base by the user with computer programming sophistication.

## More Demanding

Features of the research environment demand more of a DBMS than typical commercial products provide. To achieve the generality and flexibility required in the research environment, the DBMS no doubt must sacrifice something, usually performance.

The advantages of the hierarchical and network approaches to data base management derive from their ability to match certain (but not all) real-world examples. They gain in performance by sacrificing generality, but they sacrifice a generality that usually is not required in the commercial environment.

A general DBMS, probably a flat file or relational approach, is flexible enough to simulate any of the more specific models the hierarchical or network approaches are so well suited for, but probably without achieving the levels of performance attained by the hierarchical and network approaches.

On the other hand, the general DBMS required for the research setting will handle those applications the hierarchical and network approaches are not designed to handle. The designer must decide whether his needs fit the more restricted capabilities of the hierarchical and network approaches — which will then provide high performance — or require instead the more general capabilities typical of the research setting.

*Trilling is with Rockwell International's Environmental Monitoring & Services Center in Durham, N.C.*

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## *Bandwidth Conservation Urged*

# Cost Drops Linked to Line Efficiency

**By Ronald A. Frank**
CW Staff

CW Photo by R. Frank

David Horton

HONOLULU — More efficient ways must be found to use existing communications links if the cost of data communications is to drop, according to David Horton, director of computer communications development at Hawaiian Telephone Co.

Bandwidth is a form of energy and must be conserved through more efficient use of existing facilities and improved tariff structures, Horton said in a recent interview here.

An example of an area in which efficiencies are possible is private-line networks. Private-line tariffs were initially a response to the threat of private microwave systems, but private-line users tie up a line for 24 hours — whether or not he utilizes it — and this is not efficient, Horton pointed out.

One solution to wasteful allocation of bandwidth is the integration of services, he suggested, acknowledging this is difficult. Packetized and digitized voice is one type of integrated service that will be available in about five years, he predicted, allowing alternate voice/data traffic to operate on packet nets.

While there are inefficiencies in private-line networks, Horton does not support a recent recommendation by Italian telecommunications experts to do away with flat-rate pricing in favor of volume-sensitive tariffed offerings. As alternative integrated services become available, private-line rates should rise, but they should remain priced on a flat-rate basis and not become time- or volume-sensitive, he said.

A pioneer in the development of public data networks who helped implement the Dataroute and Datapac offerings in Canada, Horton once believed private-line nets were not needed at all. He has come to understand however, that they have their place in certain user applications, he said.

The evolution toward widespread availability of public nets got a big boost with the CCITT X.25 standard agreed upon several years ago, Horton noted. However, X.25 is now only a host-oriented interface, and other standards must be developed for terminal use of X.25 packet nets, he said.

AT&T's announcement of its Advanced Communications Service (ACS) goes a long way toward providing compatibility on a common network among terminals that now cannot talk to each other, he added. When ACS begins operation, it will inhibit the proliferation of terminals, he predicted.

The user will have to decide whether to use microcomputer-controlled terminals or existing terminals with ACS capabilities. The trade-off lies in whether the intelligence will reside in the terminal or in the network.

Proprietary barriers could be erected against the use of ACS if users do not want to entrust their corporate traffic to such a network, but this will be rare and most users will go along with the concept, he said.

As the ACS concept catches on, there may be a smaller demand for communications managers, Horton said, since much of their network configuration and operation responsibilities will shift to the carrier. These managers will still be needed to optimize costs, however.

### Simpler Nets Coming

Terminal-based networks will be improved by simplification in the coming years, according to Horton, The average manager does not want to get involved with complex access methods, and today's executive wants to have a system that can accept voice input and provide CRT and hard-copy output with a minimum of effort; these capabilities are not that far off, he indicated.

AT&T will remain as a regulated — not competitive — carrier, Horton predicted. ACS will ultimately be viewed as a needed communications service with "some processing elements in it." The ACS proposal is not really a DP service at all, he added.

At present Hawaiian Telephone is connected to Telenet Communications Corp.'s packet-switched network, but will interconnect to ACS when it is operational. There is nothing to stop U.S. carriers from tying into packet nets provided by other vendors such as Telenet or Tymnet, Inc. if they really want to, he explained.

There is currently more intrastate than interstate data traffic, resulting in a need for carriers to offer intrastate public data network facilities, Horton said. Hawaiian Telephone is doing this in the Hawaiian Islands with its Dasnet service [CW, Oct. 16].

# Police Forces in Great Britain Now Connected via a Network

HENDON, England — The Police National Computer (PNC) is now providing police forces in England, Scotland and Wales with immediate access day and night to an increasing amount of necessary information of national as well as local significance. The computer installation here at Hendon is linked to all police forces in the country by a terminal-based communications network that is operating with speed and reliability.

Information is held on the PNC in the form of separate indexes, each dealing with a particular subject. The information is designed to help police officers decide on an initial course of action and to provide a guide to the location of more detailed information which might subsequently be needed.

The indexes cover such categories as stolen vehicles, fingerprint data and wanted and missing persons.

PNC is believed to be one of the most advanced computer-controlled police networks in the world, and its success has been attributed to the coordinated efforts of the Home Office, local government and the police service.

A network of private lines provided by the British Post Office connects terminals in police stations and headquarters to the computer complex at Hendon. More than 500 terminals have been installed in police locations throughout the UK.

Links beween the PNC and local police computer systems are an additional feature of the network.

Two types of terminal devices are provided in each police force area. A form of semielectric teleprinter called a Dataprinter is used when a printed copy of an exchange of information with the computer is required by a police force. For all other purposes CRTs are provided. The CRTs are silent in operation and work faster than a Dataprinter, so they are preferred for operational work, and the number in service greatly exceeds the number of Dataprinters.

The latest is a Delta Data Systems Corp. Model 4050 terminal which includes a programmable microprocessor and up to 16K bytes of memory. It can perform I/O operations, text editing, memory management and

(Continued on Page 38)

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# Docutel Upgrades Total Teller 300 ATM

DALLAS — Docutel Corp. has introduced the Total Teller 2300, an automated teller machine (ATM) that permits financial institutions to protect their investment in Docutel equipment, according to the vendor.

More than 900 financial institutions have already installed a total of more than 3,800 Docutel Total Teller 300 ATMs domestically.

For users who already have the Total Teller 300, the added components of the 2300 can be installed into the existing 300 vault. Users don't have to make any software changes, the firm said.

A financial institution can now have a Total Teller 300 for lower transaction volume locations, replace the Total Teller 300 parts with Total Teller 2300 components in high-transaction volume locations and buy the Total Teller 2300 as an ATM program expands, Docutel suggested.

The Total Teller 2300 includes its own intelligence with an expandable memory. If the host processor fails, the ATM continues to function, a spokesman noted.

The Total Teller 2300 includes a two-denomination bill dispenser with a capacity of 4,400 new bills. Specifically designed for used currency, it needs no adjustments to handle new, used or mixed bills.

The Total Teller 2300 printers have larger capacities than existing equipment. The customer receipt printer is balanced with the money supply to minimize restocking and to meet the weekend demand.

The cost of supplies for the 2300 has also been reduced; $80 should cover supply costs for 50,000 transactions, the firm said.

Other improvements include a more durable card handler and a touch-sensitive keyboard that eliminates the reliability problems of push-button microswitches, according to the spokesman.

Field upgrades of the Total Teller 300 cost $14,000 while a Total Teller 2300 is priced at $31,500. First deliveries are scheduled for April. Nationwide service is provided by TRW, Inc., the spokesman said.

Docutel can be reached through Box 222306, Dallas, Texas 75222.

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# Bank Offers Programs to Run On BCS 90

FORT SMITH, Ark. — The First National Bank of Fort Smith is offering 75 software programs that support the Bunker Ramo Bank Control System (BCS) 90.

First National developed the programs under the standard Bunker Ramo Banktran transaction processing software to generate configuration tables and screen formats for most BCS 90-based teller terminals.

The teller terminals employ a built-in CRT screen to display customer data in real time, substantially reducing transaction time at the teller windows, the bank explained.

The Customer Information File (CIF), one program from the library, reportedly allows an authorized bank official to key in any one of five customer account numbers covering savings, checking, installment loans, certificates of deposit or commercial loans and display the entire file in summary form.

Other programs support query and memo posting, on-line data base creation and review; control of automated teller machines and large-screen graphics for displaying savings account statements, commercial loan listings and installment loan transactions.

With the exception of a few CIF and teleprocessing batch programs written in PL/1, all First National programs are in assembly coding, the spokesman said. Most of the programs are less than 4K bytes long, "with none longer than 8K bytes."

First National's central CPU is an IBM 370/135. The programs are stored on IBM 3340 disk drives with a total capacity in excess of 350M bytes. The operating system is DOS/VS with a Cics/VS telecommunications monitor and Power/VS spooler, the spokesman said.

The entire library of programs costs $50,000. The CIF program by itself costs $25,000, the BCS 90 control program is priced at $15,000 and the program to drive the automated tellers sells for $10,000, the bank said from 602 Garrison Ave., Fort Smith, Ark. 72901.

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We took a long, hard look at how you use a simple CRT terminal. We applied 10 years of experience producing sophisticated, high-performance computer products, so the newest member of HP's terminal family is engineered from just one point of view: yours.

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Interactive sessions go faster if you can look back at what you've already done. So we designed two full pages (48 80-character lines) of continuously scrolling memory into the 2621.

Recognize the 2621's keyboard? It's a lot like the familiar typewriter almost everyone's used to. Which makes the 2621 easier to learn, faster to use. And to accelerate keying in numbers, we put the numeric keypad right in the middle of the keyboard.

Then we increased the capability of the 2621's simple keyboard with eight special keys. In regular use, they control the cursor, rolling and scrolling. But they're also labelled on the screen with preprogrammed functions which, with a touch of the shift key, control self-testing, terminal configuration, display functions and editing.

Editing? On a simple CRT? Sure, because editing gets more work done faster. The 2621's comprehensive editing includes character and line insert and delete, clear line and clear display. What's more, the 2621 keeps your input separate from your CPU's so you can edit data before sending it to your CPU. And all without rewriting a line of your system's software.

And the 2621 is Bell 103A compatible and communicates with your CPU at 110 to 9600 baud through an RS232C interface. Which makes interfacing a snap.

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But we've gone a step further. How many times have you wanted just to hit a key and get hard copy of your CRT display without making a big project out of it? Now you can with the 2621P. Its built-in 120 cps thermal printer zips out a page of hard copy in seconds. With a single keystroke.

And here's more good news: the 2621A costs only $1450; the 2621P with built-in hard copy costs only $2650*.

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The 2621's bright, high-resolution CRT displays the full 128-character ASCII character set, including upper and lower case, control codes, and character-by-character underline, in 24 80-character lines.

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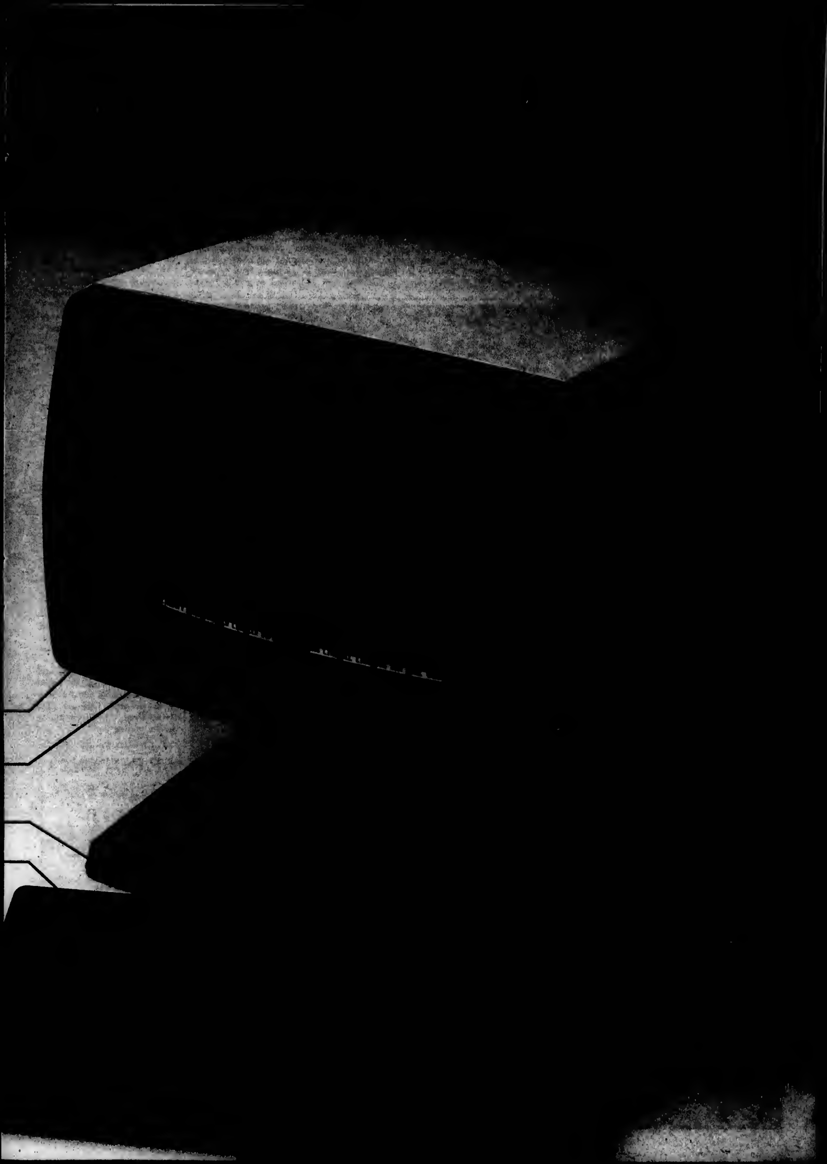

# Net Links Police Throughout Great Britain

*(Continued from Page 33)*

interfacing operations; its 25-line display offers a maximum of 80 char./line for a total of 2,000 characters.

### Centralized Training

The terminals situated in police premises throughout the country are operated by police officers or civilian staff. The training of terminal operators has been undertaken centrally by a group of police officers from various forces, assigned to the Home Office for this purpose.

The PNC's DP center at Hendon includes a Burroughs Corp. B7700 mainframe with three central processors, two I/O processors and four data communications processors. These work as an integral unit that provides protection against the failure of individual units.

Hardware, including processors and core storage, may be added or removed from the system with minimal disturbance, according to a spokesman. The system may be divided or split into two separate parts for maintenance or test purposes.

### Fail-Soft Equipment

The configuration is fail-soft. An equipment failure need not stop the system, but may merely degrade the service until the failed component is isolated and removed.

The B7700 processors normally work as an integrated unit, but can work independently if required. The system is capable of enhancement to at least twice its present capacity, the spokesman said.

Storage consists of four memory control modules, each supporting 256K (48-bit) words, giving a total capacity of 1M word over 6M bytes. Each processor is connected to each module and six simultaneous accesses to memory can be made.

The I/O processors are responsible for passing data between core memory and peripherals. Each processor has 28 data-switching channels, enabling it to deal with 28 simultaneous interleaved data transfers.

The data communications processors are small computers in their own right: two are connected to each I/O processor. Their purpose is to control the use of the network and terminals without recourse to the power of the main computer.

### Line-Terminating Units

Communications adapters are the basic line-terminating units. There are two types, one for low-speed links and another for medium-speed links.

An adapter cluster can control up to 16 mixed-speed connections and is responsible for multiplexing/demultiplexing the data received from and transmitted to terminals over the links.

Each adapter cluster is connected to two data communications processors at the DP center.

The original PNC net consisted of terminals supplied by Systems Engineering Laboratories, Inc. (SEL). The Delta Data 4050s were added last year, when the network was expanded.

The SEL terminals are used in the south of England, while the Delta Data 4050s are used in the north. There are currently about 150 of the 4050s on the network.

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## With Materials Savings to 87%

# On-Line COM Speeds SYSOUT Reports

**By Thomas E. Ferguson**
Special to CW

ROCHESTER, N.Y. – Although computer technology changes rapidly, its uses sometimes change slowly. The use of printouts and computer output microfilm (COM) is a good case in point.

Paper output has been around for nearly as long as computers, while COM is a comparative newcomer to the industry. In the past, the time and effort involved in converting DP-generated reports to microfilm was prohibitive, and various SYSOUT reports – dumps, listings needed for debugging, SYSVLOGS and other output – traditionally were (and still are) printed on paper, even if a department had ready access to COM.

Lately, however, users are finding that on-line COM can provide SYSOUT reports at speeds up to 10 times faster than the average impact printer at a materials savings up to 87%.

For example, an East Coast-based insurance company with an IBM 370/158 dedicated the machine to testing and debugging for its 600 systems and applications programmers. The installation of a laser microfilm printer negated the need for additional impact printers, trimming materials costs by more than 75% and avoiding a capital investment that would have been three times the cost of the COM unit.

In addition, the company found it gained additional savings in increased productivity because of the faster access to printouts. Space savings – microfilm consumes only about 2% of the space taken up by paper – and better integrity for reports retained were bonuses. The laser film printer is producing in excess of 75,000,000 SYSOUT print line/mo.

### Element of Success

The key to the success of COM in SYSOUT applications is that adding a laser film printer is quite unlike adding early-technology COM equipment to a computer system. The laser printer may be considered just another system printer and installed on that basis. It differs from conventional paper printers in that it operates up to 10 times faster, uses materials that cost up to 87% less and represents a much smaller investment than that associated with the large number of impact printers it may replace.

Although it can be operated off-line, when on-line, the laser printer appears to a computer system as any other printer. Software needed to operate the COM unit is resident in a built-in minicomputer.

The laser printer is transparent to programming and virtually transparent to computer operations. It operates unattended for up to 13 hours, at which point a new self-threading microfilm magazine can be inserted faster and easier than paper can be changed in an impact printer.

A helium-neon laser writes on the microfilm at 10,000 line/min, and the exposed microfiche or microfilm roll is processed by an integral nonchemical dry-heat technique.

These features all make the unit an attractive output alternative for SYSOUT reports, providing a means for reducing the highly visible paper costs associated with internal DP reports, as well as the more subtle cost of file space and search time.

SYSOUT reports can be generated for four major DP functions that occur in every DP operation: operations; facilities management; systems programming and support; and applications programming.

Computer logs are good candidates for conversion to COM, since they are often stored for as much as a year. Within Eastman Kodak Co. alone this year, approximately 2.5 million pages of these logs will be generated by a 370/158 and two 370/168s.

Although physical storage for this output is a problem, the problem of maintaining the integrity represents a more significant problem, since a missing page can destroy an audit trail that might be needed later. Obviously, this possibility is eliminated with the use of COM.

Another operations report Kodak has converted to microfilm is the CPU scheduling report, which is generated daily and has a short turnaround time and rapid-access requirements. Having this report on film has made operations more efficient, since each user need not go to a central location to find out what the next sequence of jobs sched-

*(Continued on Page 42)*

# Move to Multiprocessors Seen Continuing, Accelerating

**By Howard A. Karten**
CW Staff

PITTSBURGH, Pa. – The trend toward multiprocessor systems will not only continue but will accelerate since such systems are highly reliable and easily available, according to Daniel P. Siewiorek, associate professor of electrical engineering and computer science at Carnegie-Mellon University.

*This information was excerpted from* System Reliability and Integrity, *a 1978 Computer State-of-the-Art Report compiled by Infotech International Ltd. of Berkshire, England, and distributed by Auerbach Publishers, Inc.*

In a paper titled "Multiprocessors: Reliability Modeling and Graceful Degradation," Siewiorek stated that the multiplicity of resources such as processors, memories and buses that characterizes such systems can be used to economically create fault-tolerant systems that will degrade gracefully, instead of "crashing" with possible catastrophic results. Such graceful degradation is necessary because "computers are being applied in more situations where a computer malfunction could have catastrophic results . . . [such as] the space shuttle, airlines, hospital patient monitors and power system control," Siewiorek believes.

The problem is compounded, he continued, because the more widespread use of computers means that users are less knowledgeable. This also means there is a greater possibility of inadvertent user abuse.

Several factors have contributed to the attractiveness of multiprocessor systems, according to Siewiorek. LSI technology has provided the low-cost, high-complexity system building blocks that have encouraged a modular design of systems using standard, "off-the-shelf" technology. In addition, this technology makes system expansion easy.

Further, the paper stated, since all resources are duplicated, a system failure involving a critical or unique resource is less likely. In addition, of course, critical or expensive resources can be shared, it noted.

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# Users Warned to Proceed Slowly With DDP

Special to CW

NEW ORLEANS — When designing and implementing a distributed DP (DDP) system, "Set your first sights low; make sure the plan is solid and cut and fit the prototype until the user is happy. Then, and only then, install the other systems," Asa Whitehead, director of programming for Southern Railway System, told International Data Corp.'s recent conference on DDP here.

Southern Railway is currently installing 82 systems in railway yards, after changing its ideas several times about the type of processor it needed and the scope of jobs the distributed systems should perform.

In 1973, Southern originated what it called the Terminal Information Processing System (Tips). "We didn't recognize it at birth. It was sort of an ugly child but later we realized we had distributed DP," Whitehead remarked.

It started as an automatic switching system and later became an inventory reporting system.

Southern began with a Data General Corp. 20K-byte machine with a 2.5M-byte disk, but the programs were specific to the machine and in assembly language, therefore not maintainable by the central DP staff. Other peripherals were needed, and the system was not expandable.

Enter the DG 840 with a 10M-byte disk that was operative switching cars in mid-1975.

But then, Southern decided to expedite the processing of way bills. It removed this task from the central site batch environment and instead placed data entry at each source of entry. In this way, reports about where the information was needed could be made in a more timely manner to the distributed mini.

The next upgrade in software and hardware involved the installation of a Nova 3 with 40M-bytes of disk. Since the system came with Cobol, the central DP staff's Cobol programmers could keep busy.By late 1976, the way bill application was completed.

The central computer and the mini in the yard interact in a variety of ways to give each system the data it needs. During the sytsem's evolution, Southern discovered it could get several by-products from the data handling that were "gravy" and have proved to be good cost-savers.

One such item is demurrage, or billing for the use of cars. This information is now up-to-date, and customers can be billed accordingly.

In addition, the number of cars misassigned to trains has been cut dramatically. In the past, if Southern mistakenly sent a freight car with perishable goods to the wrong designation, it usually had to buy the car's contents.

By mid-1977, the system was built around a 192K-byte DG S/130 Eclipse with 20M bytes of disk, Whitehead said.

The systems at two prototype yards paid for themselves in terms of labor savings, he noted, adding the reduction in personnel occurred through attrition.

## Environmental Enemy

Whitehead cautioned users to pay special attention to factors affecting an installation's environment, for instance. Not only can railroad yards be hot, for example, but the dust from railway beds can be deadly to disks.

To conquer some of these problems, Southern's systems sit in cast iron, air-conditioned "caskets." Printers in various parts of the yards that show yard crews where to move cars are encased in specially designed environments, people-proof shacks that look like "one seaters."

One should plan for future demands, Whitehead also warned. "You can be sure users will want to grow devices like mushrooms if they're allowed," he commented.

Maintenance, especially when systems are so remotely located, can be a real problem. "Beware the field engineer" and make sure to negotiate for spare parts on site, he said.

In addition, the user should "examine a fallback position and make sure your rear flap is down," he said, even if this means a manual system.

Southern does not have software maintenance on site but sends out software engineers periodically. It plans to do this via down-line loading in the future...

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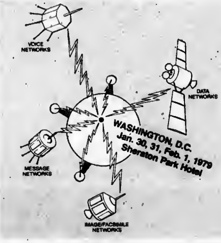

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# SYSOUT Reports Good Candidates for COM

*(Continued from Page 39)*

uled for the system will be.

Having a number of microfiche readers in the computer room and other locations means that users can look up the information rapidly, without leaving their workstations.

### Duplicating Material

Another consideration in the use of COM is duplicating: it is not uncommon to find that five copies of a particular production report are needed. Although impact printers can generate multiple copies, high-speed, nonimpact printers must print a report in its entirety every time an additional copy is needed.

However, microfilm duplicators, working off-line, can produce copies at rates up to 900 unit/hour. They can also automatically collate copies as they are produced.

Obviously, other areas can also be economically converted to COM, such as data base audits, the information in a data base and so on. In these cases, microfilm can provide security as well as save space and materials.

Applications programming is another area that generates an extremely high volume of essential listings and reports. Although programmers and systems analysts typically want paper reports on which to write, studies have shown that this habit can be replaced by the use of a scratch pad for program changes, which can then be turned over to keypunchers, suitably marked.

Kodak has found that its programmers have become more productive after making the switch, largely because of the time savings in the operation.

Listings of directories, Volume Table of Contents, catalogs and so forth can also be converted to microfilm. Some of these reports have a long life and many are updated daily. They all have a direct effect on the productivity of the programming staff. Kodak has put these reports on microfiche, and they are duplicated and distributed to seven central locations. Not every programmer or analyst needs a complete copy of each report, and the move has provided better access to these reports.

For its own use, Kodak has calculated a "break-even" point for conventional COM vs. paper, taking into account the obvious costs such as microfilm, computer time, chemicals, labor and amortization of the COM unit. It found that any program, test, or list longer than 1,125 lines — about 23 pages — is more cost-effective when output is on microfilm instead of paper.

As the great majority of reports in any DP department will be much longer than 23 pages, this break-even point effectively justifies the conversion of all SYSOUT-type reports to microfilm.

The calculations did not include the additional savings possible when an on-line unit such as Komstar equipment is used instead of conventional COM equipment.

Many DP departments are finding it is possible for them to cost-justify a laser film printer solely on the basis of their savings on SYSOUT reports. Because they are buying, in effect, a high-speed printer rather than a "microfilm department," they are able to do so without going to the higher levels of management for approval that is often necessary with conventional COM.

Since Kodak has attempted to use microfilm output in every case in which it will do the best job, it has found it could convert 75% of its output to microfilm. Yet the cost relationships are the converse: The remaining 25% paper output accounts for 75% of the materials costs.

In summary, while on-line printout of production reports on microfilm is an important consideration, DP departments can use microfilm to save a significant portion of that 17% to 25% of their paper output that is SYSOUT. A direct dollar savings is possible through space, material and labor savings. Improved turnaround time, accessibility and file integrity are other benefits.

*Ferguson is a marketing specialist in computer information systems at the Business Systems Markets Division of Eastman Kodak Co. in Rochester, N.Y.*

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### To Return West in '79

# Mini/Micro Ends Road Trip in Houston

**By Jeffry Beeler**
CW Staff

HOUSTON — Road-tested and only slightly worse for the wear, the Mini/Micro Conference and Exposition capped its first venture outside its California home base when the show pulled into town here recently for a three-day layover in sprawling Astro Hall.

The visit, which formed the second and final leg of a road trip that began last April in Philadelphia, culminated an experiment designed to test the show's drawing power in areas of the country other than its West Coast backyard.

Next year, Mini/Micro will return briefly to the security of its native Anaheim, Calif., before hitting the road again in 1980 for a relatively short trip north to San Francisco.

Reflecting on this year's experience here and in Philadelphia, show floor director Bob Rankin admitted some disappointments but defended the decision to take the event on tour outside the large West Coast computer market that has traditionally formed Mini/Micro's main base of support. "It's true we drew only 4,500 visitors in Philadelphia, and that was less than we had hoped for, but at the second show we expected attendance to jump to 6,000 and the number of exhibitors to total 80."

Photo by J. Beeler

**Some 80 exhibitors and an estimated 6,000 visitors assembled in Houston recently for this year's second Mini/Micro Conference and Exposition.**

But even if registrations here proved less than expected, Rankin would still hesitate to dismiss the show as a failure. "A lot of people who come to Mini/Micro expect to see mobs and are disappointed when they don't find them," he explained. "But you have to keep in mind that this isn't the National

*(Continued on Page 44)*

# Session Speakers Counsel Mini Users

## • Net Upkeep Outlined At IDC's DDP Show

**By Molly Upton**
Special to CW

NEW ORLEANS — After a user has bought a raft of minicomputer-based systems and placed them in a nationwide network, how can he make sure the vendor will fulfill his network maintenance requirements?

Fireman's Fund Insurance Co. constructed an incentive plan that ties the amount of maintenance fees to the monthly level of performance sustained by the network, according to Ben Bevis, Fireman's assistant vice-president for distributed systems.

When Fireman's was procuring 60 systems for data entry and local processing in offices across the country, maintenance was a key criterion in vendor selection, he told attendees at an International Data Corp. (IDC) conference on distributed data processing (DDP) here recently.

Bevis felt a "best efforts" assurance was inadequate; because vendors told him their systems didn't fail, he felt they should stand behind these statements. Not only is uptime critical, but the costs of maintenance are not inconsequential, he noted.

As a rule of thumb, maintenance charges run about 1% of the purchase price, which in Fireman's case was about $6 million for 60 Computer Automation, Inc. Syfa Systems. CA was selected after a rigorous selection process that included six vendors running benchmarks at Fireman's for about three months, he said.

To evaluate the vendor's maintenance performance, Fireman's devised an efficiency index both for individual systems and the network. The index defines performance in terms of instances and duration of downtime. Performance is calculated by divid-

*(Continued on Page 46)*

## CA Cuts LSI 4/10 Prices

HOUSTON — Computer Automation, Inc.'s Naked Mini Division has cut the prices of its largest LSI 4/10 minicomputer/memory combinations by up to 42% and the prices of its high-end Alpha 4/10 packages by as much as 45%, company spokesmen announced at the recent Mini/Micro Conference Exposition.

At the same time, the firm announced plans to sell its LSI 4/10 CPUs with half-card, 16K-word and 32K-word random-access memories (RAM) equipped with battery backup.

With the price cuts, which will take effect in February, a 4/10 CPU that now sells for $2,125 (including battery backup and a 16K-word RAM) will cost $1,365.

Meanwhile, the price of a packaged Alpha 4/10 with a 32K-word RAM, power supply, clock, five-card chassis and operator console will drop from $4,690 to $2,560.

CA credited the price cuts for the LSI 4/10 mini/memory combinations to the availability of higher density memory boards and the price reductions for the packaged Alpha configurations to the use of the 16K-word half-card RAMs. Before the company packaged its 4/10 CPU with half-card memories, it used full-card memories.

Despite the price cuts for the 16K-word and 32K-word 4/10 CPUs and systems, the prices of entry-level 4/10 products will remain unchanged. A 1K-word and 4K-word 4/10 CPU will still cost $520 and $645, respectively, while a minimum Alpha 4/10 configuration with processor board, power supply and chassis will continue to sell for $995.

CA's Naked Mini Division is located at 2181 Dupont Drive, Irvine, Calif. 92713.

## • Go On-Line Slowly, Mini/Micro Talk Says

**By Jeffry Beeler**
CW Staff

HOUSTON — Don't believe the oft-repeated vendor claim that you can automate all your applications in one day, Basic/Four Corp. systems manager Cheryl Krumlund urged users and prospective users at the recent Mini/Micro Conference and Exposition here.

Although feasible in theory, one-day implementation usually proves difficult if not impossible to accomplish in practice. The problem lies not in preparing systems for their users, but in getting users ready for their systems, Krumlund explained.

"One of the most common mistakes users make is to underestimate the need for preparing their data for computerization," the systems manager noted during a conference session entitled "Keys to Success in Selecting and Installing a Minicomputer for Business." As a result, applications that under ideal circumstances would require only one day to automate frequently take much longer to prepare.

Because the human element of computing poses such an obstacle to speedy installations, Krumlund advised users to implement their applications gradually. "Never try to place more than two jobs on-line at the same time — and preferably only one," she admonished her listeners.

Which applications a user should implement first depends on the company's job priorities, she added. If a user installs a system primarily to control its inventory, then inventory control should probably go on-line before any other application. "But if you have no critical needs to meet, start with an easy job like payroll or accounts payable," she told users.

*(Continued on Page 46)*

# 'S' Version of HP 9825 Addresses 24K Bytes

PALO ALTO, Calif. — Features that are optional with the Hewlett-Packard Co. 9825A desktop computer are now standard with a less expensive, memory-enhanced version of that product — the 9825S, according to an HP spokesman.

Compared with the HP9825A, which provides a minimum main memory of 8K bytes, standard 9825S reportedly stores 24K bytes. In addition, the S version incorporates a strings/advanced programming read-only memory (ROM) plus an HP 9872 plotter/general/extended I/O ROM.

These two features are said to be standard with the 9825S, whereas with the 9825A they are available only as extra-cost options.

When acquired together as part of an S version package, the two ROMs and an HP 9825 desktop computer cost 10.5% less than they would if bought separately, the spokesman explained.

In other product news, HP announced a 50% price cut for the 9825A's ordered, field-installed memory plus price cuts of up to 40% for some of the desktop computer's ROMs. With the reductions, a 9825A field-installed memory sells for 10 cent/byte, while the strings/advanced programming ROM and the 9872 plotter/extender I/O ROM now cost 29% and 25% less, respectively, than before.

### No Compiling

Elaborating on the 9825S' features, the spokesman credited the desktop computer with eliminating software loading and compiling. Moreover, editing functions are implemented in software, and an audible alarm warns of syntactical programming errors, the source said.

The strings ROM allows users to manipulate large amounts of data by adding statements to the 9825S' resident language, while the advanced programming ROM provides language enhancements that allow users to increase the sophistication of their programming techniques, the spokesman ex-

(Continued on Page 46)

# Mini/Micro Ends Tour in Texas

(Continued from Page 43)

Computer Conference."

Among the event's strongest attributes, he said, was its conference program. With 30 sessions covering seven main topics, the program here was said to have been perhaps the strongest in Mini/Micro's four-year history.

### Few Oases

The exhibit floor, however, was another story. Because of Mini/Micro's largely regional appeal, many vendors used the occasion less as a vehicle for launching new wares than as an excuse for rehashing old ones. In fact, as a setting for formal product announcements, the show proved a kind of DPer's desert — an impression heightened by the transplanted cacti adorning Texas Instruments, Inc.'s extensive exhibit.

Even the harshest deserts have oases, however and the Mini/Micro exhibit area was no exception. One of these new product "oases" — Information Processing, Inc. (IPI) — announced its entry into the microcomputer software field with the disclosure that its Blis/Cobol operating system can now support the Data General Corp. Micronova.

With the introduction of the ANS 74 Cobol-based product, Micronovas for the first time can concurrently perform functions like data entry, applications development, transaction processing and inquiry response for multiple users, according to IPI sources. Competitive Micronova operating systems, by contrast, can provide only single-user environments, they added.

Capable of supporting DG's 10M-byte disk units, the multiuser operating system reportedly allows Micronova users to expand upward through the Nova and Eclipse series systems without having to recompile their programs.

As a virtual memory operating system, the IPI product also provides features like dynamically updated indexed files with up to three alternate keys, spooling, screen management through Cobol, online debugging, Cobol programs as large as 200k bytes and system utilities.

Priced at $4,000, the Micronova version of Blis/Cobol is available from IPI at Suite 320, 1850 Lee Road, Winter Park, Fla. 32789.

### Remex Debuts

Remex, meanwhile, used the show as an occasion to announce two products — its Data Warehouse storage system and the RFD 4000/4001, a dual-head floppy disk product that emulates its Shugart Associates and IBM counterparts.

Consisting of a sealed, Winchester disk system from California Computer Products, Inc. and two Remex floppy disk units, the Data Warehouse reportedly provides 17M bytes of fixed storage and 730K to 2.5M bytes of removable storage. Remex credits the product with transferring 960K byte/sec from the fixed medium up to 62.5K byte/sec from the removable media.

The Data Warehouse costs $6,700 in OEM quantitites.

The RFD 4000/4001, by contrast, comes in single- or double-density configurations with capacities of 800K or 1.6M bytes, respectively, Remex officials said. In addition to being media-compatible with the single-sided IBM 33FD and double-sided IBM 43FD, the dual-head unit is physically and electrically compatible with the Shugart SA850 and SA851R, Remex said.

Among its other features, the product rotates at 360 rev/min, provides an 83 msec latency, settles in 15 msec and accesses in an average of 91 msec with 3 msec track-to-track access, Remex spokesmen added.

Like the Data Warehouse, the $740 RFD 4000/4001 will become available during the first quarter 1979 from Remex at 1733 E. Alton St., Box C19533, Irvine, Calif. 92713.

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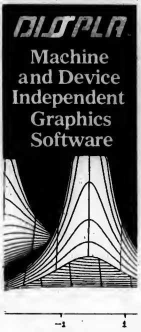

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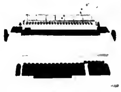

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# HP 9825S Has More Memory

*(Continued from Page 44)*

plained.

Like the advanced programming ROM, the three I/O ROM versions also provide programming language enhancements that let users address peripherals and external devices through five I/O cards. Each additional ROM reportedly contains 8K bytes of nonuser-addressable memory.

## Minimum Configuration

Although the 9825S typically supports a maximum main memory of 24K bytes, the desktop computer can expand to 32K bytes "in special cases," the spokesman said. That increase, however, robs memory space usually allocated to ROM.

A minimum 9825S incorporates a 9825A desktop computer with 8K bytes of main memory expandable in 8K-byte increments. In addition, the computer concurrently supports up to four 500K-byte flexible disk units, a built-in 16 char.-wide strip printer that outputs 32 char./sec and up to 14 additional printers.

The 9825S also supports an integral CRT unit plus an optional second terminal. But as a basically stand-alone unit, the computer loses its interactive capability with the second terminal, the spokesman cautioned.

Optional peripherals available with the 9825S include a 30 char./sec impact printer, a 200 line/min line printer and a 240 line/min thermal printer.

Although the machine does not compete directly with any other unit, it does belong in roughly the same product class as Digital Equipment Corp.'s PDP-11/03-based Minc system, a packaged configuration for laboratory applications, the source said.

Like the 9825A, the S version reportedly suits engineering, mathematics and statistical applications as well as instrument control functions.

Designed for operation by non-DP personnel, the 9825S attaches to instruments and peripherals through 16-bit parallel, bit serial or BCD interfaces or through the HP interface bus.

The package costs $7,700 and is available from HP at 1501 Page Mill Road, Palo Alto, Calif. 94304.

# Network Upkeep Paid on Point System

*(Continued from Page 43)*

ing the number of points the vendor earned by the total number of available points, which is the number of systems multiplied by 50. A system earns 50 points for perfect performance during a month.

## Amber, Yellow and Red

There are three different statuses, each with different point penalities, Bevis explained. Amber status is when a system is degraded for nine consecutive hours or inoperable for more than 30 minutes. Each amber status costs five points.

A yellow status occurs when a system is degraded for 18 consecutive hours or inoperable for four consecutive hours; it costs 25 points. A red condition, which happens when a system is degraded for 36 consecutive hours or inoperable for 18 consecutive hours, costs 50 points.

The scheme is calculated on a network-wide basis, and the network maintenance charges consist of the efficiency index multiplied by the maximum monthly maintenance charge. However, if the efficiency index is .90, Fireman's pays 100% of the maintenance charge; if the index is .45, it pays nothing.

A .90 rating allows every system to have two Amber conditions in a month, Bevis pointed out.

The clock starts running when Bevis calls the vendor. Fireman's has instituted its own network service center to act as the focal tracking point.

Bevis has found that many of the trouble calls pertain to users' ignorance about the vagaries of applications programs. He has therefore added an applications specialist to handle hot-line calls.

During the selection procedure, Fireman's subjectively evaluated each vendor's maintenance responsiveness and ease of development in addition to performing benchmarks tests.

Some of the considerations Bevis focused on were whether the vendor performed his own maintenance, who does the maintenance report, the type of downtime reporting system maintained by the vendor and whether the gear had dial-up diagnostic and down-stream loading capabilities.

Fireman's required the vendor to do his own maintenance and was leery of firms whose maintenance functions were profit centers in their own right. Bevis felt these vendors would be less likely to make calls than if they reported to their marketing departments.

During the benchmarking, Fireman's found a high level of competition among vendors, with prices declining, performance increasing, software development accelerating and delivery schedules improving, Bevis said. The finalists included IBM, Four-Phase Systems, Inc., Digital Equipment Corp., Computer Automation, Microdata Corp., and Datapoint Corp.

Four Fireman's programmers attended each vendor's classes for a week and then wrote a data entry and query program which was run on the machines

## Stopwatch Verdict

Vendors, armed with stopwatches, followed Bevis as he timed machines with his set of stop watches. When they were dissatisfied with their results, they altered their system software and then tried again, he said.

Some of the tasks timed included data entry — measuring two aspects: the number of 50-character data records entered by six terminals in one minute and then with the benchmark load, including two terminals performing disk lookup, a printer and communications.

Other tasks included disk file lookup, both with and without the benchmark load, and various aspects of a system under the benchmark load, including data entry, disk file lookup and print spooler.

In addition to the stopwatch verdict, there was subjective evaluation of relative vendor responsiveness and ease of development.

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# Slow Move On-Line Urged

*(Continued from Page 43)*

Speaking on the subject of minicomputer hardware implementation, Krumlund also advised users to question the familiar vendor claim that they can continue to rely on their old processing methods until they are sure their newly installed system can perform its intended functions.

## Old Approach Not Possible

"The old notion of operating parallel systems is just not possible for most applications," she asserted. "Most people who install a minicomputer were already overburdened with their previous system, so it's not likely that they will be able to manage the extra load of a new computer system."

In other advice, Krumlund urged users to place responsibility for managing a new system in the hands of one individual. Without some form of central control over system operations and procedures, each user will set his own job priorities and anarchy will quickly ensue, she warned.

Once appointed, the systems manager in turn must appoint a systems operator or team of operators and institute the appropriate training programs.

Software houses provide one source of operator training, and other sources are also available. But wherever they train their personnel, managers must make sure they have two qualified individuals to perform each computer job.

Without some form of personnel backup system, minicomputer users could soon get into trouble.

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### More Than 10,000 Runners

# Micros Help Score New York Marathon

NEW YORK — As close to 10,000 runners crossed the starting line of last month's New York City Marathon, more than 40 volunteers and an array of computer equipment — including two microcomputers — prepared to time and score the runners at the finish line in Central Park. The 26.2-mile race through the five boroughs of New York was billed as the largest such race anywhere; and the 8,588 runners who crossed the line over a five-hour period were the greatest number ever scored by an automated system.

Included in the system were three Computer Identics Corp. bar code scanners, two Intel Corp. 8080 microcomputer systems and a Data General Corp. Eclipse C/330 minicomputer. The scanners and the Intel systems were located in a van at the finish line, while the minicomputer was in a midtown Manhattan office.

The system consisted of two phases: The first was the data capture system provided by New York Telephone Co., a corporate sponsor of the marathon, on the Intel micro system. Push-buttons at the finish line were wired directly to the micro; whenever a runner crossed the finish line, a button was pushed and an interrupt was generated within the computer.

This caused a time to be registered along with a lane identifier. Three adjacent but logically separate finishing lanes were used because of the volume and density of the finishers.

After crossing a finish line, runners were directed to one of three holding chutes, where bar-coded tags attached to each runner's number were torn off and placed in order on a wire spindle. The spindles were numbered consecutively as new holding chutes were opened (only one of the three chutes per finishing line was open at any moment).

When chutes were closed (after 60 to 100 runners), the completed batch of tags was brought to a nearby van. There the tags were scanned with the bar code scanners, which were wired to the micro system.

In order to keep all three scanners continuously busy, batches of tags could be scanned out of order since the micro could reorder them using the sequential batch identifiers. Unscannable or missing bar-coded tags were hand-entered via the scanners' keyboards.

Once the data was input into the micro, runner numbers and times were combined for each of the three finishing lanes. The lanes were then merged into a stream of data which was sent to the minicomputer over a 1,200 bit/sec phone line and a simple packet protocol set up for the application.

#### Scoring Phase

The second phase of the system was the scoring facilities provided by Personnelmetrics, Inc., a small consulting firm here that was responsible for the computer scoring of the 1977 New York City Marathon and the 1978 L'Eggs Mini Marathon. The scoring was handled on the minicomputer running under DG's Advanced Operating System.

One program read the data coming from the micro and stored it on disk and magnetic tape (the tape was used as backup). A second program read the time and runner number data stored on disk and looked up the runner's name, sex, age, country and team in a direct-access data base that had been developed over the preceding three months.

This data was written to a finishing list which was printed on a 1,200 bit/sec Digital Equipment Corp. Decwriter back in the van in Central Park. This second program also

*(Continued on Page 48)*

# E-H Builds Portable System For Eprom Programming

OAKLAND, Calif. — Described as a self-contained, portable system that eases the programming of erasable programmable read-only memory (Eprom), the Model 4 from E-H International, Inc. can be used to program different Eproms from keyboard commands.

The system contains all the pin drivers to program, emulate, verify and alter all Eproms with 4K to 128K memory. The Model 4 can emulate incircuit devices to aid troubleshooting, communicate directly with a development system through a serial data interface and upgrade Eproms in program capacity by use of the 2K by 8-bit random, access buffer memory and move routines.

A serial I/O port enables the Model 4 to communicate directly with a development system, terminal or teletypewriter, E-H said. It can also perform check-sum verification and execute move and list commands; it has fully buffered and cold sockets, a spokesman noted.

A companion system, the Model 16B production programmer, was designed to repeat a program into 16 memories at once for fast Eprom duplicating, the firm said. The Model 16B features replaceable plug-in mother sockets and bypass lights to show program status at each socket, according to the spokesman.

The system automatically blank-checks programs and verifies all Eproms when started, he added.

Both models program triple-supply 2704, 2708 and 2716 Eproms and single-supply 2508/2758, 2516/2716 and 2532 Eproms as well as 2732, 2564 and 2764 Eproms. The Model costs $2,495 and the Model 16B costs $4,995 from E-H International, 515 Eleventh St., Oakland, Calif. 94607.

# Sort/Merge Designed for 6800

W. LAFAYETTE, Ind. — Users of 6800 microprocessors can now take advantage of a full-disk sort/merge package that was designed for high speed and convenient operator interface, according to its vendor, Technical Systems Consultants, Inc. (TSC).

Written in 6800 Assembly language, the package is compatible with the standard 8-in. Flex disk operating system found on Southwest Technical Products Corp.'s DMAF-1 floppy disk system. Any type and size file may be sorted, TSC noted.

Features include any size of fixed- or variable-length input records, fixed or variable length fields, user-definable record and field terminators and up to 20 input or output keys.

Included in the price of $75 for the sort/merge package (AP68-10) is a user's manual and 8-in. Flex disk containing the object code. The manual may be purchased for $15.

A catalog of microcomputer software products mainly for the 6800 and 8080 microprocessor is available for 25 cents from TSC, Box 2574, W. Lafayette, Ind. 47906.

# Systems With 8-Bit Ports Get Analog Input Module

BROOKFIELD, CONN. — Connecticut Microcomputer has introduced the AIM16, an analog input module for its data acquisition modules systems.

The Aim16 has 16 8-bit analog inputs which are individually addressed; conversion time is 100 microsec. The AIM16 can be used with any system that has an 8-bit output port and an 8-bit input port.

The AIM16 costs $159. A starter kit with the AIM16, power supply and input and output connectors is priced at $189 from Connecticut Microcomputer, 150 Pocono Road, Brookfield, Conn. 06804.

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# Probe From Intel Extends Troubleshooting to 8085

SANTA CLARA, Calif. — Intel Corp. has introduced a probe subsystem that reportedly broadens the applications range of the Uscope 820 microprocessor system console. With the Probe 8085, the Uscope can be used to troubleshoot systems based on 8085 and 8085A as well as 8080A microprocessors, the firm said.

The Probe 8085 connects the Uscope 820 console to the system under test via the microprocessor socket. This allows the microprocessor actually used in the system under test to continue to operate during testing so total system operations can be diagnosed, a spokesman noted.

Used in combination with the Uscope 820 console, the Probe 8085 allows a user to simplify fault isolation by executing automatic diagnostic programs on the 8085 system; enter a detailed troubleshooting mode via the Uscope 820 console's 32-bit-wide break point, 128-byte overlay random-access memory (RAM) and 256-level machine cycle trace memory; and examine the actual flow of an 8085 program.

The Uscope 802 console and Probe 8085 can be purchased as a kit for $2,795.

The Probe 8085 alone costs $825 from Intel, 3065 Bowers Ave., Santa Clara, Calif. 95051.

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# *'Z,' Xitan Users Organized*

SAN ANTONIO, Texas — Two users groups have been formed recently, the Z Users Group and the Xitan Users Group.

The Z Users Group was formed to exchange information between Z8, Z80, Z8000, Mostek 3880 and other microprocessor users in the same family.

The group plans to publish a newsletter with information on systems and applications software, interfacing problems and solutions, evaluations, extensions and modifications to products.

The Xitan Users Group will also publish a newsletter with information relevant to Xitan, Inc. products on such things as modifications, extensions and evaluations of Xitan products, difficulties encountered, clarification of documentation and products to be bought, sold or traded.

Dues for both users groups are $5 a year. More information can be obtained from contacting either the Xitan or Z Users Group, 1015 Navarro, San Antonio, Texas 78205.

# S-100 Debug Board Allows Stepping Through Program

TALLAHASSEE, Fla. — The Tracer is an S-100 board that provides complete program control by a combination of hardware and firmware, according to its maker, Objective Design, Inc.

With interrupts, the Tracer enables the user to single-step through a program, whether in programmable read-only memory (Prom) or read-only memory (ROM), and contol all ongoing processor actions, a spokesman explained.

The debug software resides in on-board firmware (Proms); customized software to match a user's system is available, the company indicated.

### No Restart Vectors

The on-board interrupt hardware does not require use of the restart vectors or the low address space, the firm said. Five unused interrupts are available for system use, with vectors to any address in memory.

The Tracer is available in kit form with two Proms for $244.95 from Objective Design, P.O. Box 20325, Tallahassee, Fla. 32304.

# Report Evaluates Micros

PENNSAUKEN, N.J. — More than 65 microcomputer vendors and approximately 600 different products are discussed and evaluated in a report recently released by the Alltech Publishing Co.

"Introduction to Personal Computing" compares and defines the major products and equipment of each vendor and lists the computer stores and catalog houses the material can be found, a spokesman said.

The report also identifies key literature sources and personal computing publications that might aid the user in equipment selection, he said.

The publication contains a full listing of the names, addresses and telephone numbers of each vendor, the spokesman added.

The report costs $25 from the publisher at 212 Cooper Center, Department 2, N.Park Drive and Browning Road, Pennsauken, N.J. 08109.

# Two Micros Help Score Marathon

*(Continued from Page 47)*

notified race officials as runners qualified for any of the more than 125 awards offered by the New York Road Runners Club and other organizations.

With this system, copies of the finishing list were available for runners to check their times and places at the awards ceremony that evening. After final editing of the finishing list (largely deletions of unregistered runners), an official list was prepared.

### Automated Typesetting

In addition, a tape of the finishing data was sent to Data Reduction, Inc. of Woodbury, N.Y., for automated typesetting that will be used in the preparation of a results publication.

In addition to the scoring work, Personnelmetrics created and maintained the data base of all entrants. Any deletions, additions or editing were processed on this data base; reports such as listings by running number or name and statistical lists — distributions by country or by state — were also produced from the data base.

Aside from reports, the system produced acceptance letters, registration cards, bus passes and mailing labels.

*Tilewick and Anderson are with Personnelmetrics, Inc.*

# *Beginner Pens Book on Basic*

HOUSTON — A book for beginners written by a beginner, *"The User's Guide to North Star Basic"* by Robert R. Rogers, is now being published by Interactive Computers.

Rogers, a microbiologist without any prior knowledge of computers or the Basic language, has chronicled his learning experiences from start-up to program completion, according to the company.

### Step-By-Step

The book takes a step-by-step approach with discussions and examples covering 36 major topic areas. A number of programs for games, teaching and business are included to demonstrate particular programming techniques.

The 200-page book costs $14.95 and is available from computer stores or from Interactive Computers, 7620 Dashwood, Houston, Texas 77036.

# Hewlett-Packard ends the computer compromise.

## The HP 250

The lowest-priced computer with true data base management, the HP 250 was designed to be simple both to program and operate. The keyboard is like an electric typewriter, the numeric pad like an adding machine, and the CRT adjusts vertically and horizontally for comfortable viewing.

Eight soft keys underneath the screen can be programmed to lead the user through each task step-by-step. They'll also help you cut corners in writing applications software, especially when working with the other tools we provide—IMAGE/250 DBM and its inquiry scheme QUERY/250, FORMS/250, and REPORT WRITER/250.

The system can accommodate four terminals and has up to 256K bytes of main memory. You can also get up to three flexible discs, or one flexible plus one fixed disc, built right into the unit. (Total storage can expand to 40 megabytes.) A self-test system and easy maintenance of the CPU and memory boards, all on a roll-out chassis, are two more features of this exceptional computer. Another is the price: it starts at just **$24,500.**

## The HP 300

Virtual memory, silicon-on-sapphire (SOS) technology and an Integrated Display System gives the HP 300 big performance in a very compact frame.

It can handle up to 16 users simultaneously, grow to a megabyte of main memory and over 250 megabytes of disc storage, do transaction processing and sort-and-print jobs simultaneously, and control every application from the central console. Its eight programmable soft keys can be captioned on the display to give the user a series of choices in running a job. And the display itself divides into multiple 'windows' for viewing several different parts of an application. They can even be scrolled individually, both vertically and horizontally, to a width of 160 columns and several thousand lines in length.

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## The HP 3000 Series 33

The latest addition to the HP 3000 family, the Series 33 also uses SOS to
lot of power into a simple desk unit. Designed for multiple users at remote ter
the system can expand to a megabyte of error-correcting main memory, and grow
megabytes of disc storage. It offers both the operating system (MPE III) and IM
data base management that set the HP 3000 line apart from other interactive com

The basic system consists of the CPU (now on three chips totaling less th
square inch instead of 700 square inches of PC boards), 20 megabytes of cartri
disc storage, a double-sided flexible disc with one megabyte capacity, and a micro
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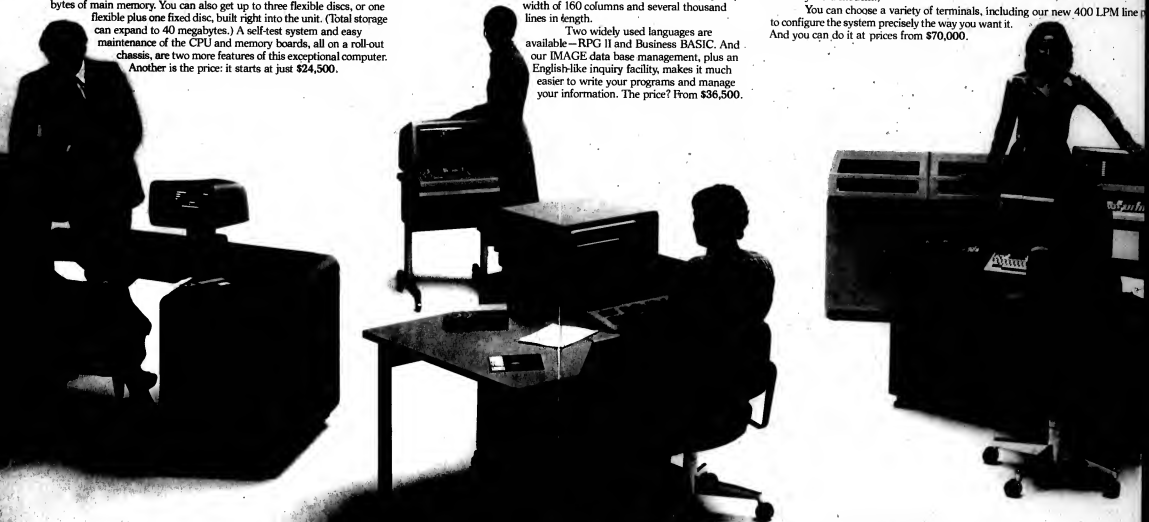

For a hands-on demonstration of these computers, call the HP office listed in the White P

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# The HP 3000 Series III

The top of the line HP 3000 Series III offers more power than the Series 33, while sharing the same powerful operating system and data base management. It has six high-level languages (COBOL, RPG, APL, FORTRAN, BASIC and SPL), as well as networking and manufacturing software* for inventory control and materials planning. And 16K RAM semiconductor memory is available for the unprecedented price of $32K per megabyte.

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# Input Peripheral for Range Of Uses Comes in Kit Form

SCOTTSDALE, Ariz. — Talos Systems, Inc. has introduced the Digikitizer, an input peripheral for architectural and mapmaking functions, mathematical analysis, motion picture film generation and medical and dental analysis, the firm noted.

The Digikitizer has an active surface area of 11 in. by 11 in. and a resolution of 200 line/in. The data rate is 100 coordinate pair/sec and is switch-selectable from point to continuous operating modes.

Features include an RS-32 option with selectable transmission rates and a high-resolution Apple Computer, Inc. interface add-on board. Interface boards to the Radio Shack Co. TRS-80 and Imsai Manufacturing Corp. systems will be available soon, the company said.

The Digikitizer costs $449 from Talos Systems, Inc., 7419 E. Helm Drive, Scottsdale, Ariz. 85260.

# Word Generator Fits TM-500

SAN PEDRO, Calif. — A four-channel by 32-bit 30MHz word generator that plugs into Tektronix, Inc. TM-500 series power modules is now available from Pulse Instruments Co.

The Model PI-210 was designed to operate with Pulse Instruments' PI-100A clock generator to provide the industry's only digital word pulse generator, the firm said.

The combination of the two devices is intended for testing high-speed digital circuits and systems.

Additional features of the PI-210 include a variable word length up to 32 bits, 12k-bit maximum word length by cascading and serial or parallel data format.

The PI-210 costs $850 from Pulse Instruments Co., 1536 W. 25th St., San Pedro, Calif. 90732

# Lab Users Get Z80-Based Micro

BURLINGTON, Mass — Described as a desktop Z80-based microcomputer, the Eastern Analytical Bluebird from Eastern Analytical Laboratories, Inc. was designed for running laboratory routines and mathematical and statistical analyses.

Using self-prompting software written in 14.6K Extended Basic, the instant-on system features a high-resolution monitor, full Ascii keyboard, math pad and 13 user-definable keys. Other features include 32K random-access memory expandable to 64K and dual magnetic tape cassettes, each with 500K bytes of storage.

The Eastern Analytical Bluebird costs $8,700 and the thermal printer $1,550 from Eastern Analytical Laboratories, Inc., 1 "A" St., Burlington, Mass. 01803.

# Objective Design Unveils S-100 Card

TALLAHASSEE, Fla. — Objective Design, Inc. is offering the Syscon, an S-100 card designed to complement a user's CPU by providing programmable read-only memory (Prom), 254 bytes of scratchpad random-access memory (RAM), true Call-type interrupts, power-on jump, real-time clock, on-board generation of Mwrite and an 8-bit parallel output port.

With the proper bootstrap program in Prom, Syscon can get a disk-based system going while providing the real-time clock and interrupt characteristics of a high-power computer, according to the company.

The Syscon board without Prom is available in kit form for $207.95 from Objective Design, Inc., P.O. Box 20325, Tallahassee, Fla 32304.

# *Zilog Reduces Prices For Systems, Components*

CUPERTINO, Calif. — Users of Zilog, Inc. systems can now take advantage of price reductions in selected systems, boards and components.

The MCZ-1/20 tabletop MCZ floppy disk and the MCZ-1/25 rack-mount MCZ floppy disk are available for $6,490 each, a reduction of $850. The MCZ-1/05 tabletop MCZ floppy disk has been reduced from $6,100 to $5,990.

The Z80 RMB/48 price for quantities of one to nine has been reduced from $1,850 to $1,350; the Z80 MDC/48 from $2,095 to $1,495 and the Z80 I/O board from $350 to $295.

The Z80 and Z80A CPUs in the same ceramic packages and temperature range are now available in quantities of 100 or more for $12.85 and $15.45 respectively, less than half their former prices, according to the firm.

In the same package and temperature range, the dual-channel Z80 and Z80A serial I/O circuits, formerly priced at $54 and $68, in lots of 100 or more, have been cut to $35.70 and $39.30 respectively.

More information is available from the Zilog Publications Department, 10340 Bubb Road, Cupertino, Calif. 95014.

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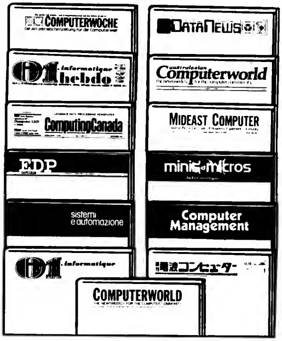

| Country | Installed Value of General Purpose Computer Systems | % of total world value | World Rank as DP Market |
|---|---|---|---|
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| Japan | 8,331 | 10.0 | 2 |
| W Germany | 6,527 | 7.9 | 3 |
| United Kingdom | 4,794 | 5.8 | 4 |
| France | 4,768 | 5.8 | 5 |
| Canada | 2,301 | 2.8 | 7 |
| Italy | 2,119 | 2.6 | 8 |
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| Brazil | 532 | 8 | 17 |
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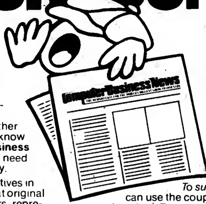

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## Cost of Capital Not a Factor

# Industry Seen Weathering Recession

**By Marcia Blumenthal**
CW Staff

How will the computer industry fare as the prime rate — expected to rise even higher — clocks in at 10.5% to 11% and a recession, the third of the decade, threatens to hit in mid-1979?

"There is reason for concern but not panic for 1979 and 1980," Frederick Withington of Arthur D. Little, Inc., said succinctly. Withington's comment summarized the generally unpessimistic mood of computer industry observers who were recently interviewed about the effects of high interest rates and a predicted industry recession.

Most analysts agreed that high interest rates will swell the demand for leased equipment. However, if the money supply becomes tight, lessors would be seriously affected.

Lessors generally don't think there will be a shortage of capital as there was during the recession of 1974 and 1975 (see story on Page 60). Users would willingly absorb the increased cost of leasing resulting from the higher interest charges incurred by lessors in financing their lease bases, they maintained.

### No Postponement Seen

Users will probably not put off the acquisition of mainframes unless the recession is particularly severe, according to Withington. Users of large-scale systems have long-range plans; even during the 1974-1975 recession, there was only a brief postponement in acquiring large systems, which was quickly made up by a surge in demand, Withington recalled.

However, those users contemplating the acquisition of large and medium-size equipment typically want long-term leases. Vendors, who are in a strong financial position today, want to use their funds for inventory and expansion, rather than to finance leases for their customers at high interest rates.

Consequently, Withington concluded, manufacturers at all levels within the industry will be trying to induce customers to purchase equipment, but customers will want to lease.

"I'm more concerned with the cost of money slowing things down than I am about a drop in demand caused by a recession. But, if the Administration and the Federal Reserve Board stick to their guns and hold to policies they have recently announced, I wouldn't be surprised to see interest rates hit 15%," Withington said.

Although interest rates could hit 15%, the duration rather than the level of these interest rates was the concern of one Wall Street economist.

However, users contemplating purchases or leases of add-on equipment such as memory or disk drives may hold back on expenditures, Withington continued. And, of course, vendors who cater to the small business user will feel the bite of a recession.

### Hedge Against Inflation

At Drexel Burnham Lambert, Inc., staff researchers did not think most users contemplating near-term acquisitions of equipment will shelve those plans because computer equipment is viewed as a labor-saving device and hence an inflation hedge.

Most healthy computer firms have sizeable backlogs which will supply about six to 10 months' worth of annual revenue. Moreover, much industry revenue is derived from foreign sales; a repeat of the last recession, which was worldwide, is not expected.

Harry Edelson, vice-president of research for Drexel Burnham Lambert, said that, on the whole, the computer industry is in good shape to withstand a recessionary period.

"The likelihood of sustained high interest rates in 1979 could work to the disadvantage of the computer industry if large numbers of users elect to lease rather than purchase equipment. In that case, earnings would be depressed somewhat because outright sales are more profitable than leases in the short term," he said.

The major shift from leasing to outright purchase in the past three years may be halted, but pricing and investment tax credits will prevent a reversal of that trend, Edelson said.

### Cleaner Balance Sheets

Edelson pointed out that computer firms have cleaned up their balance sheets, particulary their debt-to-capitalization ratios. For instance, he remarked, Burroughs Corp.'s debt-to-capitalization ratio slid from 34% in 1972 to 9% in 1977.

*(Continued on Page 60)*

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# *AM Makes Bid To Acquire Microdata Corp.*

LOS ANGELES — Addressograph-Multigraph Corp. (AM) has made a bid to acquire Microdata Corp., offering Microdata shareholders a one-for-one stock exchange.

Donald A. Graham, president and chief operating officer of Microdata, said his company's board of directors is reviewing the proposal: "Addressograph-Multigraph spent some time reviewing us and our board is now considering its offer in some depth." Although Graham would make no further comment on the offer, he said Microdata had not been seeking to be acquired.

On the other hand, AM has been active in acquisitions and has been moving into the computer industry. Since Roy L. Ash became AM chairman about two years ago, his aim has been "to move into new era markets through advanced technology." AM is currently in a strong cash position with $50 million reportedly on hand.

"We're moving the whole company in the direction of electronics for business management, particularly as it relates to information management systems," Ash said.

The acquisition of Microdata would mark AM's entry into the general-purpose computer systems industry sector.

### Two Recent Buys

Aside from the proposed Microdata acquisition which at recent market prices would allow AM to acquire Microdata for about $47 million, AM has been involved in two other takeovers. On Oct. 16, the company agreed to purchase for $1.5 million Micro Data Corp., a small, privately owned firm in Dayton, Ohio, which specializes in micrographics for engineers.

To date, AM's largest acquisition is ECRM, Inc., a Bedford, Mass.-based firm specializing in laser-driven printing systems, text editing equipment, optical character recognition equipment and high-resolution facsimile systems for the newspaper industry. That acquisition should be completed later this month, with AM paying $4.50 a share for approximately 1.2 million shares of ECRM.

Microdata ended its last fiscal year with $64.9 million in revenues, a robust increase from 1977's revenues of $37.7 million. Earnings for 1978 totaled about $4 million or $1.81 a share compared with 1977 earnings of $1.9 million or 86 cents a share.

---

# Small Lessors Exempted From At-Risk Tax Ruling

**By Marcy Rosenberg**
CW Staff

CHICAGO — The Computer Dealers Association (CDA), which had voiced objections to the Steiger-Hansen tax bill's proposal to apply the at-risk rule to small companies, gained some ground in the version of the bill that was passed recently.

The CDA also rallied, though unsuccessfully, to have the investment tax credit limitation raised to 90% in 1979 instead of 1982, as proposed.

Although the 1982 effective starting date prevailed, the CDA did win an at-risk rule exemption for equipment leasing activities of small companies under certain conditions.

Under the at-risk rule, an operating loss on a transaction is not deductible except when actual money is at risk, CDA legal counsel Joe Manello explained.

"What we objected to," according to Chris Ragland, CDA chairman of the Federal Government Liaison Committee, "was the proposed amendment which stated the at-risk rule would apply to any closely held corporation in which five or fewer individuals own more than 50% of the stock."

By this definition, "the rule would apply to 60% to 70% of our members and create disastrous accounting problems for us," he said.

This rule would have affected computer dealers because "they commonly borrow money from financial institutions to pay for the equipment they buy (and subsequently lease) and give these institutions a nonrecourse note exempting the dealer from personal liability," Manello said.

"Because they would have no money at risk, dealers could not deduct any net operating losses against other business income if the at-risk rule applied," he added.

One such operating loss for computer and other equipment dealers is depreciation which, in the early years of equipment life, usually exceeds net income, Manello explained.

### Collective Effort

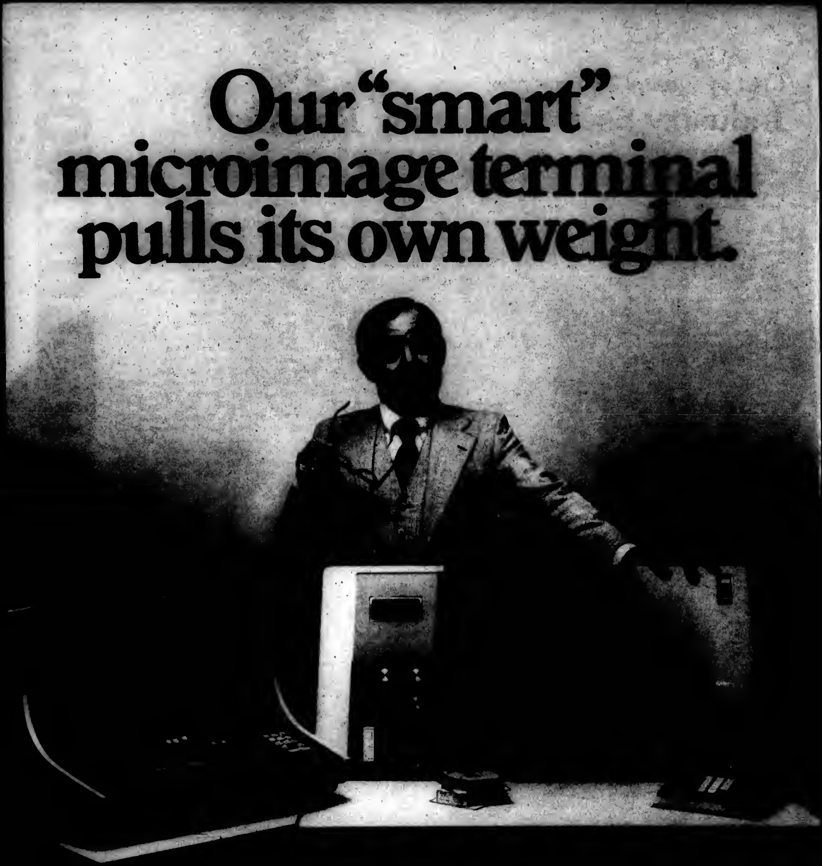
Initially, "a lot of associations such as rent-a-car people were individually fighting the extension of the at-risk rule," Ragland said.

The CDA, however, got these people together in a collective effort, he noted, to take the issue "out of the area of special interest groups."

What they got for their efforts, Ragland said, was another amendment to the bill which stated: "However, the equipment leasing activities of closely held corporations will not be subject to the at-risk rule if such corporation is actively engaged in equipment leasing. That is, if 50% or more of the corporation's gross receipts are derived from equipment leasing.

"For purposes of this provision," it further

*(Continued on Page 63)*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# *IBM, Nigeria in Venture*

ARMONK, N.Y. — The Nigerian government has accepted in principle a plan for a joint venture between IBM and various Nigerian enterprises, according to IBM. If approved, the move will be IBM's first joint venture with foreign nationals, a spokesman admitted.

Spurred by the requirements of the Nigerian Enterprises Promotion Decree of 1977, the plan calls for the formation of a company, Data Processing Maintenance and Services, Ltd (DPMS). IBM will hold 40% of the shares of DPMS and will offer the remaining 60% for sale to Nigerian enterprises, the spokesman said.

At present, IBM is doing business in Nigeria through its wholly owned subsidiary, IBM Nigeria. DPMS will provide maintenance for IBM data processing equipment, as well as data services and DP systems engineering.

IBM intends to appoint a DP sales agent in Nigeria, the spokesman said. IBM said it seeks to comply with the law in each country in which it does business.

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The statement of qualifications should include in the following format:

1. Firm name and address
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3. Balance sheet or published financial statement
4. Date firm was established
5. Type of ownership and if minority owned
6. Name of parent company, if any
7. Summary of consulting services and fees for the last two years
8. Work by firm which best illustrates current qualifications relevant to this project. List each project on a separate page indicating:
   a. Nature of project and consultant's responsibility
   b. Nature of client's responsibility
   c. Client's name and address
   d. Duration and completion date of project
   e. Estimated cost — entire project
   f. Estimated cost — work for which firm was responsible
9. Supply resume of employees that could be assigned to project and their responsibilities

Firms may submit additional information which will assist the MBTA in its evaluation.

Those firms adjudged most qualified will be furnished a more detailed scope of services statement and requested to submit technical and price proposals.

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Consideration will also be given to each firm's internal affirmative action policy, the use of minority businesses in Joint Venture or as subconsultants.

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# Third-Party Lessors Not Daunted By Skyrocketing Interest Rates

**By Marcia Blumenthal**
CW Staff

When the cost of capital skyrockets, the demand for leased equipment quickens. Even with high interest rates, lessors are confident they can find the capital to finance the additional equipment needed to meet that demand, they said in recent interviews.

But the lessors interviewed did not appear to be basking in bonanza fever. They admitted banks and other funding sources will probably become more selective in granting loans; which could hurt some smaller leasing firms.

For example, financial institutions may hesitate to make loans to lessors featuring equipment from less well-known manufacturers, according to Donald Mikesell, product director of capital equipment leasing at Commercial Credit-McCullagh Leasing, Inc. Mikesell also pointed out, however, that many small leasing firms are very aggressive and are managed with a high degree of professionalism.

### Rationing Feared

Sonny Monosson, president of American Used Computer Corp., is concerned about the prospect of banks rationing funds. Recently returned from a convention of the American Association of Equipment Lessors, Monosson reported that Peter C. Fitts, president of Citicorp Leasing, warned lessors they could expect aggressive competition from banks in all sectors of the equipment leasing market.

Those lessors financing equipment leases will find severe competition from leasing subsidiaries of banks, Fitts told convention-goers.

The degree to which lessors will be affected by the selectivity of moneylenders depends on how firmly a lessor's sources of financing are in place, according to Olie Swanky, president of Greyhound Computer Corp. Smaller leasing firms may not have access to the variety of funding sources used by larger companies, Monosson remarked, citing as an example double-signed notes with insurance companies used by larger leasing companies.

On the other hand, if the supply of money tightens, lessors may find a good market for used equipment, Swanky remarked.

Swanky said he is looking forward to a slowdown because it makes people more selective: "The 1974 crunch forced users to make better analyses of price/performance ratios."

Lessors with portfolios of older equipment may stand to reap better returns than they would if the emphasis were on new equipment, Swanky added.

### Expensive But Available

Whatever stratosphere interest rates enter, the user will have to absorb the cost of capital. Kenneth Pontikes, president of Comdisco, Inc., said users would be willing to absorb those costs.

"Capital is expensive, but it is available," Pontikes remarked, observing that capital was not available in 1974.

Like many Wall Street observers of the computer industry, lessors are counting on companies going ahead with DP expenditures realizing that the productivity and cost savings gained from using computer systems are a trade-off to the marginal costs of capital incurred in financing that equipment.

# Industry to Weather Recession

*(Continued from Page 57)*

Another Wall Street observer, who asked not to be identified, noted that today's computer products are more credible than those of 1974 and 1975 and are in the early stages of their lifecycles, still attractive to users.

Another factor which may quell the move toward leasing, that analyst pointed out, is that the purchase-rental ratio of computer equipment has improved dramatically since 1975. In 1975, for instance, a 40- to 50-month rental was required to equal the purchase price of the equipment. Now that time period has dropped to 30 months.

### Carter Campaign

Although the Carter Administration has asserted that its inflation-fighting campaign will not cause a recession, which is defined as two consecutive quarters of falling national output, private economists are not so sure.

Citibank economists are predicting that Carter's meaures to defend the dollar on world money markets may cause the nation's money supply to tighten, causing a recession by mid-1979.

Otto Eckstein, president of Data Resources, Inc., said that "for the first time in my life I am predicting a recession."

Whether the computer industry will fare as well as industry experts think remains to be seen, but a clue may be gained from Kenneth H. Olsen, president of Digital Equipment Corp.

At the company's recent annual meeting, Olsen said "the future is something we don't see clearly, and we don't believe the people who do. We're planning for all possibilities."

For the next year, Olsen predicted "far less than the 40%" growth the company had in 1978.

# Executive Corner

- Timothy J. Conroy has been named vice-president of corporate services at Software International Corp.
- William W. Dryfoos has been promoted to director of federal marketing at Inforex, Inc.
- Louis J. Finnegan has been named eastern regional sales manager for Xylogics, Inc.
- Matt Stein has joined Estey-Hoover advertising and public relations agency in Newport Beach as an account executive.
- Robert A. Weaver has been appointed vice-president of finance at Wordplex, Corp., a wholly owned subsidiary of AES Data Ltd. of Montreal, Canada.
- Donald M. Edam has been named vice-president and general manager of Applied Digital Data Systems' new Draper, Utah, facility.
- James P. Campbell has been appointed to the position of vice-president of administration at Data General Corp.
- Michael Clements has been promoted to vice-president of engineering at Amdahl Corp.
- Dharam Ahuja has been named product line director at the Large Systems Group at National Semiconductor Corp. James Ashbrook has been appointed manager of market planning and strategy at the firm.

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## *More Than 720,000 Sites*

# POS Market Seen Topping $2.4 Billion by '82

WALTHAM, Mass. — By 1982, the dollar value of the installed base of all segments of the point-of-sale (POS) equipment market will top $2.4 billion, boasting installations of more than 720,000 devices.

The collective POS market grew 23% in dollar value and 20% in the number of units installed between 1976 and 1977, according to a recently published report from International Data Corp. (IDC) here. By the end of 1977, a total of 316,000 POS devices were installed in the U.S., up from the 1976 count of 262,000.

The discount and specialty store sectors, both offshoots of the giant general merchandise sector, have the most promising future, IDC predicted.

While the use of POS equipment is now trickling down to the smaller, low-volume end of the retail industry, POS vendors are transforming the traditional general merchandise and supermarket sectors with the introduction of second-generation POS equipment which incorporates Universal Product Code (UPC) scanning and electronic funds transfer (EFT) capabilities, IDC noted.

This development, according to *Autotransaction Industry Report* (AT/IR), an IDC publication, coincides with the growing maturity of POS in the general merchandise sector. In fact, AT/IR pointed out, 94% of general merchandise POS installations are in department stores, and industry experts believe that sector is 70% saturated.

NCR Corp. has captured the leading market share in both the general merchandise and supermarket POS sectors, according to IDC.

### Maturity Means Markets

One of the older markets, POS has overcome user and consumer resistance, slow development of source-marking codes and conflicts between retailers and bankers and among retailers themselves, AT/IR said.

The growing maturity of the POS industry is spurring acceptance of POS devices in new market segments. By 1982, IDC predicted, the number of POS devices installed in discount stores will top 46,000 units, with a value of nearly $140 million.

The specialty store sector is even more promising, with a projected 1982 unit installation volume of 31,000 devices accounting for more than $170 million.

The use of low-cost microprocessor-based equipment is the ripple spreading this trend. The result is cheaper machines offering considerable power to small retailers who don't need extensive systems backed by mainframes or minicomputers, AT/IR reasoned.

For example, Data Terminal Systems Corp.'s Model 150 electronic cash register has 4K bytes of read-only memory with 64 random-access memory locations and is priced at $795, AT/IR noted.

### Traditional Sectors

While POS equipment is gaining wider acceptance among smaller retailers, the more traditional general merchandise and supermarket sectors are not napping.

The number of general merchandise terminals installed at the end of 1977 increased 16% from the previous year. The major action was in the supermarket sector, IDC noted, with year-end installations darting ahead 59% from 1976, racking up a 51% dollar value increase for a total of $210.8 million at the end of 1977.

By 1982, IDC predicted, general merchandise POS will still be the largest sector, with an installed base valued at over $1 billion and annual growth of 11%. However, supermarket POS will grow 20% between 1981 and 1982 alone, IDC estimated.

Second-generation equipment incorporating scanning capability will be in demand, AT/IR predicted. There are now about 300 supermarkets nationwide with UPC scanning, and that number is expected to double by the end of this year.

Ironically, AT/IR pointed out that Univac's decision to discontinue its Accuscan supermarket POS system because of the slow growth of UPC scanning came at just the time when UPC scanning is starting to proliferate. AT/IR reported 36 scanning sites were started in August.

The healthy market for POS equipment is fattening the coffers of NCR, which currently holds 36% of the general merchandise installed base, according to IDC. NCR has taken over market dominance in the general merchandise sector from the defunct Singer, AT/IR said, suggesting that with Singer's machines now ready for replacements, competition is heating up.

TRW, Inc. and ICL, Inc. are the two leading contenders for the Singer replacement business, AT/IR said.

In the supermarket sector, NCR dominates with 59.7% of the market and National Semiconductor Corp. follows with 25%.

AT/IR forecast a replacement for NCR's aging Model 255 and noted that National Semi's Datachecker is well received by supermarkets, but said the company appears to be constrained by limitations in its marketing and maintenance forces.

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# Software Firms in Need of Systems Personnel

By Marcia Blumenthal
CW Staff

ORLANDO, Fla. — Unless software companies can attract systems personnel in greater numbers, the growth of that sector of the computer services industry will suffer.

An informal *Computerworld* poll of representatives from software development firms during the recent annual meeting of the Association of Data Processing Service Organizations, Inc. (Adapso) corroborated that view and revealed that many positions for systems personnel in those companies are currently unfilled.

Adapso President-elect John Imlay, who is also president of Management Science America, Inc. (MSA), noted that a major mandate for Adapso's Software Issues Committee is to seek ways of attracting personnel to the industry.

The dearth of applications software in the marketplace was made embarrassingly explicit during a conference session as executives from major mainframe and minicomputer companies practically begged software vendors to write applications software compatible with their hardware. Burroughs Corp., Honeywell, Inc., Data General Corp. and Digital Equipment Corp. were among those hardware makers seeking software.

While not disparaging hardware makers who are now investing in software development, Imlay said their approach has been to develop software so they can sell hardware. To be a successful competitor in the industry, he said, hardware companies must set up separate corporate entities or divisions which do not relate the software aspect of the business to the hardware side of the business.

There are currently about 676 independent software vendors. The typical vendor in this group, according to Imlay, has been in business eight years, has about 30 employees and markets one to two software products. Because most of these companies are small, he continued, they cannot afford to develop applications that will run on several different vendors' hardware.

Consequently, software developers tend to write applications that can be run on the largest installed base of computers — those from IBM, with the result that other hardware vendors have lots of machinery but very little software to run on it, Imlay noted.

### Rustling Up Interest

While hardware makers are hot on the trail of applications software, software companies are trying to rustle up interest in the software industry, particularly among recent college graduates. Imlay said he spoke to 19 college audiences last May attempting to attract students to the industry.

Why hasn't the software industry been able to attract new personnel? Well, for one thing, the concept of standardized packaged software is just starting to become widely accepted. When the software industry started, it didn't have much of an image, and most DP installations had a "not made here attitude," he said.

Graduates entering the job market cannot readily identify with the software industry, he observed. Consequently they are absorbed into DP installations or into software research and development for hardware manufacturers. "Many recent graduates want a stable environment with plentiful resources," Imlay declared.

"If a systems analyst is willing to move around from project to project rather than being confined to one installation, he or she will gain a broad sense of the industry and will be able to develop state-of-the-art technology by learning what potential users want a system to do," Imlay observed.

The "freedom to do what you want" theme is the marketing tack independent software firms are taking, Imlay noted, adding, "When software people see the systems they have created sold several times, it gives them a great sense of pride."

# SI Division to Serve Small Systems Needs

ANDOVER, Mass. — The demand among small systems users for applications software for stand-alone and distributed DP functions has resulted in the formation of a new division of Software International Corp. (SI).

In making the announcement, SI President William G. Watson said, "The new division is a complete organization dedicated to providing and supporting applications software systems to users of the most popular small business computers and minicomputers."

Donald K. Lane, formerly executive vice-president of SI, heads the new division.

SI began offering its general ledger and financial reporting, accounts payable and accounts receivable applications products to users of small systems more than a year ago, Lane said. Since then, the company's sales have been 155% better than projected, he added.

Now all of the company's financial applications products are available for both small and large systems. "Computers for which our packages are now or will soon be available include IBM System/3 and System/34, the Hewlett Packard Co. 3000, the Univac 90/30, Honeywell, Inc.'s H62, Interdata's 7/32 and 8/32, Burroughs Corp.'s B1700/1800, ICL, Inc.'s 2903/2904 and the Wang Laboratories, Inc. 2200," Lane said.

The company expects to supplement its financial packages in the near future with manufacturing applications software products.

# Contracts

**General Automation, Inc. has received a contract from the Montana Energy and MHD Research and Development Institute, Inc. to design, develop and install a distributed data acquisition network valued at more than $1 million.**

Kennedy Co. has been awarded a contract in excess of $250,000 by Seiko of Tokyo, Japan for its Model 9100 tape transport to be used in Seiko's IBM Series/1-based small business systems. This agreement is for two years with renewal options.

**Paradyne Corp. has received a lease contract from Tennessee Building Products for implementation of a PIX-II "virtual data link." The three-year contract is valued at $39,600.**

General Telephone & Electronics Corp. has been awarded a five-year contract by Paine, Webber, Jackson & Curtis, Inc. for its GTE Financial System One. The system will be installed in the brokerage firm's 149 offices throughout the country.

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## Selling Information Products Arm

# Omron Sets Deadline on Purchase Inquiries

CHICAGO — Parties interested in acquiring the Information Products Division of Omron Electronics, Inc., a Sunnyvale, Calif., facility that manufactures user-programmable CRT terminals, have until 5 p.m. Thursday, Nov. 30, to submit inquiries for details regarding the division's sale, the company said.

The cutoff date was established to assure an orderly consideration of inquiries received since the divestiture plans were made public on Oct. 18, according to Omron executive vice-president Robert J.J. Gaudio.

"Several large, terminal-oriented and DP equipment manufacturers have begun discussions on possible terms of purchase," Gaudio explained, "but other interested parties continue to appear. In order to move negotiations ahead with qualified bidders, we must exclude any inquiries received after the end of this month."

### Customers Notified

All customers of the Information Products Division have been notified of Omron's divestiture plans, Gaudio added.

The division maintains all design and manufacturing operations in Sunnyvale and sells to U.S. markets through a direct sales force of eight Omron representatives plus 12 independent representative firms. Sales and service offices are in: Englewood Cliffs, N.J.; Washington, D.C.; Schaumberg, Ill.; El Segundo and Sunnyvale, Calif.; and Seattle.

### Has Been Profitable

The Information Products Division has been profitable, Gaudio noted, contributing 12% to 15% of Omron Electronic revenues. With current employment at around 110, the unit has grown steadily since its founding in 1973, developing both design engineering and software capability.

The division's sales are exceeding forecasts. Its recently introduced Model 8038 Uniscope Emulating Terminal has been well received, the firm noted. The division remains one of the few independent CRT terminal manufacturers to lease equipment directly to commercial and governmental accounts, with a profitable lease base now in existence, Gaudio said.

"We are divesting primarily because the unit is no longer aligned with the growth plans and direction that have been established for Omron Electronics, Inc. Long-range plans place top priority on components for the industrial automation marketplace," he explained.

# Firms Exempted From Tax Ruling

*(Continued from Page 57)*

stated, "equipment leasing gross receipts is to include gross receipts derived from the sale and servicing of the same type of equipment leased by the corporation."

Also affecting the CDA was the bill's tax limitation provision regarding investment tax credit. This provision increased the investment tax credit limitation from 50% to 90% on a phased-in basis of 10 additional percentage points per year, beginning with taxable years which end in 1979. In addition, the used property limitation was increasd from $50,000 to $100,000.

### Not to Exceed 50%

Before, the federal government allowed anyone who buys capital equipment to deduct 10% of the equipment cost from taxes immediately, Ragland said, but the amount of tax credit accumulated in one year could not exceed 50% of the firm's earnings.

The House of Representatives made the proposal to add the additional 10% per year through 1982, at which time the maximum amount of tax credit allowed for one year would be 90% of earnings.

Sen. Russell Long (D-La.), chairman of the Senate Finance Committee, wanted that 90% maximum to start next year instead of in 1982 to spur capital investments, and "We were in perfect harmony with Sen. Long," Ragland noted.

### Spur Capital Investment

Getting the 90% right away, he said, would "spur corporations, dealers and leasing companies to make capital investments in computers and also have the ripple effect of freeing more used computers that dealers could sell or lease to smaller companies that may not be able to afford new computers."

He estimated the used computer market at about $1 billion.

The House proposal was made permanent, but Ragland maintained, "We'll be back next year to get the 90%. This year, we were 'Johnny-Come-Lately,' trying to jump in at the 11th hour and do a Mexican hat dance."

However, Ragland thinks he will have a better shot at it next year if, as expected, 1979 brings a recession. During a recession, he said, "the first thing that goes is capital investment and I have no doubt that the tax limitation would then go to 90%."

**Looking back.**
**And ahead.**

All indications have it that 1978 will go down as another banner year for the computer industry. User spending for 1978 should at least match the IDC — projected $42 + billion, up 15% from 1977. Budgets in almost every major category show increased growth over 1977, and 1979 is shaping up to be a repeat performance.

Our December 25/January 1 Combined Issue Special Report takes a look back at the year in computers, as well as a look ahead for 1979. The *Computerworld* editorial staff will take a break from the holiday season just long enough to give you some hindsight and foresight on topics like:

- *The impact of inflation on computer use and configuration*
- *User-vendor relations*
- *Market trends — products projections for '79*
- *The year in court — IBM and Memorex*

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**Martha Kellner**
**Mini Computers**

PROG ANALYSTS-Assembly lang on Mini's & Micro's for hardware/software devl. $18-25K.
PDP-11-RSTS/E, or RSX-11 operating sys, to design int'l banking apps. $22-27K.
SYS ENGR-Learn DEC-20 software (TOPS 20 & MACRO 20). Prefer FORTRAN TS bkgd. To high $20's.

**Bruce Neuman**
**Programming**

Prog-OS/COBOL, 2 years exp. $19K.
PROG-OS/BAL, Train CICS. $24K.
PROG-OS/FORTRAN, strong math bkdg. Train O/R analysis. To $19K.

**Michael Shenker**
**Systems**

SYS Analyst-Heavy design-Min Prog-Learn DL-1. To $26K.
SYS Prog-MVS/CICS internals, to $28K.
SYSTEMS-No Programming, to $23K.

**Al Weingartner**
**M.I.S.**

EDP Auditors, Big "8" exp. NYC-No travel. $25-30K
SYS ENGR-Heavy Internals-CICS-Major multi-national corporation. $29K.
PROJ MGRS-Design thru implementation, $31K.

All positions are fee paid. For further details forward resume in confidence, or call COLLECT

**GAGE ASSOCIATES**
170 Broadway, N.Y., N.Y. 10038
Suite 910 (212) 287-0030

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# ATLANTA

Losing your individuality in a large Shop? Major Computer mfgr has created 2 positions in a newly-formed division responsible for developing mini-computer USER applications software. Excellent suburban location; high mgmt visibility.

## To $25,000 Data Base Design

Indiv selected will be responsible for all data base activity incl file coordination & DB Dictionaries. Challenge to this position is the coordination & direction provided to project teams in developing major application in a mini environment. Reqs 4+ yrs heavy DB including recent work w/minis.

## To $23,000 Education Coordinator

Best of both worlds - teaching & systems design. 50% of the time will develop course contents, conduct training sessions, & advise prog/analysts on availability of utilities. Remaining time will be spent w/project teams consulting & participating in developing mini applications. Reqs strong communications skills & project design exp.

Above positions represent a partial list of active local searches. All fees paid by hiring cos. Send resume in conf, including salary & geographical preferences, to Ron Spang, 404/393-0933, specialist with "hands-on" EDP exp.

**FOX-MORRIS**
**Personnel Consultants**
**47 Perimeter Ctr. East, N.E.**
**Atlanta, GA 30346**

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# Principle Programmer

$2031 - $2453/mo - Manage small sys prog staff; operate sys modification/maintenance for B6700 (MCP, compilers, message control sys). Recommend performance enhancements to hardware/software.

**Send resume to University of California, Staff Personnel, 312 Mrak Hall, Davis, CA 95616 for job #0593 by 11/27/78.**
***Equal Opp Employ/Affirm Act Plan/Fem-Male Handicapped.***

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# KINGDOM OF SAUDI ARABIA

## UNIVERSITY OF RIYADH

The University of Riyadh in Riyadh, Saudi Arabia has positions for:

## COMPUTER SYSTEM ANALYSTS

QUALIFICATIONS:

1. College degree in Computer Science from an accredited university.
2. Minimum of two years experience in computer analysis and programming.
3. Complete knowlege of Cobol, Fortran and basic computer languages.
4. Must have ability to read, write and understand Arabic as well as English.

Please submit applications and resume along with copies of all available documents (certificates and references) as soon as possible to:

**Dean of Admission and Registration**
**University of Riyadh**
**P.O. Box 5733**
**Riyadh, Saudi Arabia**

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# EUROPE

## ASM PROGRAMMERS

Minimum 3 years Assembly Language Online application programming essential. UNIVAC experience helpful. Good salary and interesting benefits. 1-2 year assignments beginning January. Prefer single.

Send resume and salary requirements to: Mr. Paul R. Newlove

**FLORENCE INTERNATIONAL, INC.**

*918 Youngstown Road*
*Niles, Ohio 44446*

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# PROGRAMMER/ANALYST

## MINICOMPUTERS

Excellent opportunity for individual to be the "Computer Expert" at an on site location at an operating Nuclear Power Plant in upstate New York.

**Will be responsible for:**

- Daily operation and software maintenance-existing programs
- Development and application of new programs
- Analysis and recommendations for use of:

Off Site Computer Facilities
Commercially Available Programs

**Desired experience:**
The successful candidate must have at least three years of progressively responsible assignments in programming, development, and analysis for minicomputers such as Eclipse C330 or PDP1170. Background in both process realtime and record management batch processing together with knowledge of both assembly and computer languages will be helpful.

Please send resume indicating salary requirements, experience and education to:

**Mr. Patrick Frawley**

**POWER AUTHORITY**
**OF THE STATE OF NEW YORK**
**JAMES A. FITZPATRICK NUCLEAR POWER PLANT**
**P.O. Box 41C, Lycoming, New York 13093**
***Equal Opportunity Employer M/F***

# Join the company that's #2 in small business computers (and going for #1!)

At Wang, we believe that the key to our success has been our focus on the end user. That's why we probably have one of the largest direct sales marketing and service organizations in the computer industry. Our newest computer, the VS (Virtual Storage Computer), is the most sophisticated of its kind and the easiest to use. That's why in combination with our 2200 small business computer systems we have doubled the dimension of our computer market potential, which now accounts for nearly 1/4 of all small business computer installations worldwide. And that's why Wang has moved into the Fortune 1000 and has become the fifth fastest growing company in the US with revenues of $200 million and 11 consecutive quarters of record growth. No wonder that we've been acknowledged as second only to IBM in the sale of small business computers.

And that's where you come in. There isn't another company in the industry that can offer you comparable individual responsibility plus the opportunity for personal and professional growth. At Wang, your contribution is demanded, acted on, and has visibility at the highest levels of the company. Excellence of achievement, ability, and quality are recognized quickly and well rewarded. If you are frustrated by being buried deep in the corporate heap, by having your ideas gather dust, by having personal initiative blunted by rigid policies, then you need the fresh, fast-growing world of Wang.

**We need these EDP professionals:**

## Marketing Managers

We need aggressive, self-motivated EDP experienced Marketing Managers looking for top corporate visibility. Must be capable of managing and implementing imaginative product development projects, supporting them and bringing them to the field, generating enthusiastic response, and aggressive sales efforts. Responsibilities will include existing and new computer products and systems. You must have 8-10 years of experience in the computer marketplace, including a strong computer sales track record. Good communications skills are required for presentations to top level management. Your background must also include development, planning, or promotion of computer hardware/software products.

## Customer Engineers

We are looking for a number of individuals throughout the country to maintain and support our Wang VS computer system. The individuals we seek should have a minimum of 2 years experience in the maintenance of various medium to large scale computer systems, as well as the maintenance of sophisticated computer peripheral equipment. An ASEE or equivalent is required.

## Product Support Specialist

Our Technical information Center is the first line of communication with customers, salespeople, and analysts. We need individuals with a programming/systems background and a desire to move into marketing to fill this high visibility position. You will be a primary reference source for all of our computer products. You should have a college degree in computer science or business along with at least one year of programming experience and a knowledge of COBOL, BASIC, or RPG applications.

## Computer Salespeople

At Wang, we've developed a remarkably sophisticated interactive business computer system. It's called the Wang VS, and it's the kind of large system that the marketplace has been waiting for. If you have large system sales experience, familiarity with corporate data centers, and the expertise to work with experienced data processing professionals, there's a place for you on a Wang VS sales team. A proven track record in hardware/software sales is required. Positions are located throughout the country.

## Field Analyst

We need individuals who can support corporations and work with both their management and their technicians. You will be required to make corporate product presentations, conduct product demonstrations, determine configurations, and work with our sales personnel to develop proposals. The individuals we are seeking should have experience in IBM 370s, COBOL, BAL, some form of RJE, and either CICS or IMS. Experience with BASIC and/or RPG-II would be of added benefit. Openings exist for various geographic regions.

## Marketing Specialists

We need EDP professionals who can provide technical sales support to Wang's worldwide field sales organization on our new VS computer. Data processing experience is a key requirement. You will need competitive knowledge of the computer industry and of commercially oriented large-scale sophisticated computer systems plus a technical understanding of computer hardware and software. Bring with you good communications skills, a proven track record of successfully supporting an aggressive field sales organization, and a college degree; and we'll show you individual growth opportunities you have been waiting for. Previous sales/marketing experience with a vendor would be a definite plus.

## Marketing Analyst

We are currently looking for an individual for our marketing development group who will be specifically responsible for increasing our market penetration within the manufacturing industry. Analysis and recommendation of software offerings along with the responsibility to manage activities with our advertising, systems development, training and sales departments requires an individual with strong communications skills. The ideal individual should have a successful sales background in the data processing industry, experience selling to manufacturing firms, and a good understanding of general business applications. Corporate marketing experience plus an MBA are highly desirable.

**We offer excellent salaries and benefits. Please submit your resume, including salary history and indicating position or positions of interest, to Gary C. Bionglewicz, Manager Professional Recruiting, Wang Laboratories, Inc., One Industrial Avenue, Lowell, MA 01851; or call him at (617) 851-4111.**

We are an affirmative action employer

Computers

WANG

Word Processing

# *SYSTEMS PROGRAMMER*

**The Touchette Corporation**
**Syracuse, New York**

TOUCHETTE needs qualified Systems Programmer with a minimum of three years' experience in DOS/VS, POWER VS systems generation. Responsbilities would include Sys Gen, Software Evaluation and Planning, and Technical Support.

**Salary Open—
Company-Paid Benefits
Company-paid Interviews**

University of Nebraska's Nationwide Survey rates Syracuse #1 in New York State. Call collect or send resume to:

Mr. Daniel J. Healy
**The Touchette Corporation**
5701 Enterprise Parkway
East Syracuse, NY 13057
Telephone: (315) 445-0291

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# Programmer Analyst

We are looking for a professional who desires advancement and takes pride in personal accomplishments.

We require at least 2-3 years Burroughs COBOL experience. Data management experience in DMS 2, or FORTE preferred. Ideal candidate could be promoted to Systems Analyst within 1 year.

We offer a competitive starting salary and excellent company benefits. Please send resume in confidence to, or call:

J.W. Boyle
(312) 262-7700
C.P. Clare & Co.
3101 W. Pratt
Chicago, IL 60645.

*Equal Opportunity Employer*

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## ADMINISTRATIVE APPLICATIONS PROGRAMMER

Minimum of two years of Administrative Data Processing with a knowledge of Data Base Systems and COBOL. Experience with Burroughs B6700, Burroughs COBOL and ALGOL highly desirable.

Duties include working directly with administrative users to implement, modify and maintain the programs and systems for their offices.

$14,500-$16,000 plus excellent benefits and FREE TUITION.

Send resume by November 30, 1978 to:

Gail Brooks
Employment Manager
UNIVERSITY OF DETROIT
Detroit, Mich. 48221

*The University of Detroit is an equal opportunity/affirmative action employer.*

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DESIGN ENGINEERS ☐ PROGRAMMERS/SYSTEMS ANALYSTS

# NCR's financial terminals can do as much for your career as they do for financial institutions.

No other company is as solidly in the vanguard of financial terminals development as NCR. We've revolutionized the banking business, and we mean to dominate this continually expanding field.

If you're a person who can make significant contributions to new generations of intelligent POS terminals, modular terminal-networks and firmware/software systems . . . get in touch with us—fast.

As a Design Engineer you'll be making rapid strides in advanced microprocesor applications, distributed data processing, networking and data communications. As a Programmer/Systems Analyst you'll have total systems involvement and will see your contributions as an integral part of a working, state-of-the-art system. Show managerial ability, and management responsibilities will come rapidly. Terminals make the system. At NCR/Dayton they also make careers.

*We have immediate openings for professionals with experience in these areas:*

### DESIGN ENGINEERS

- **Microprocessor Applications**
- **Digital and Analog Circuits**
- **Electrical Control Circuitry**
- **Terminal Peripherals**

*Familiarity with microprocessor programming helpful for all positions.*

### PROGRAMMERS/ ANALYSTS

- **Microcomputers**
- **Minicomputers**
- **Operating Systems**
- **Distributed Processing Systems**
- **Communications Software**

*Requires background in Assembly and COBOL languages.*

We offer an outstanding compensation and benefits package, wide open career paths, and a location that offers friendly, lower-cost midwestern living at its very best.

**Please send resume and current salary requirements promptly to:
Mrs. Judith E. Chorazewitz, Engineering & Manufacturing—Dayton, Employment Dept. N50, NCR Corporation, Dayton, Ohio 45479.**

An Equal Opportunity Employer

NCR
Complete Computer Systems

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# PROGRAMMER/ANALYST

Harris is a leading manufacturer of high capacity, offset printing presses for the publication and newspaper printing industry, and a division of a profitable, professionally managed corporation with an aggressive product development and diversification program.

New opportunities due to our rapid growth are presently available in data processing for programmer/analysts whose responsibilities will include applications in accounting, material requirement planning, order entry/billing, shop floor control and other areas. Your work will be primarily in new development in defining applications, designing and programming, and installing the applications with project leaders supervision.

Position requires a minimum of 3 years OS applications, with high proficiency in ANS and COBOL. Must have personally designed, programmed and installed a multi module medium to large scale OS application. Other helpful experience would include on-line transaction applications (CICS), interactive programming (VM/370), BOM, MRP, shop floor, costing, inventory, and structured designing and programming.

Competitive salary and comprehensive benefits are offered.

For confidential consideration please forward resume and salary requirements to: Harris Corporation, Web Press Division, Personnel Manager, Mechanic St., Pawcatuck CT 02891.

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# H - 6080

On the spot offers for junior (1-2 yrs) and intermediate (2+) programmers with H-6000 or HIS Level/66 applications programmers with COBOL, GMAP or FORTRAN Exp. Progressive non defense systems group expanding it's suburban Northern Virginia office. Help a major user develop his State of The Art Interactive Honeywell Data base System. Advance into TP or Data Base Management Systems. GCOS, IOS or TOS/TPE helpful. Some Senior level reqs. exist. Salary Range from $15,000 to Mid Twentys. Brand new facility, free parking, health, dental, retirement any other benefits. We are really moving — are you ready to move? If so call us @ 703/356-1997 and evening till 9 PM or write: Computer Science Div. CYBERMETRICS CORP. PO Box 576, McLean VA 22101 E.E.O/ M/F

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# SYSTEMS PROGRAMMER

Beckman Instruments, Inc., a leading manufacturer of medical and scientific instrumentation needs additional systems programmers to meet company expansion requirements.

As a Systems Programmer, you will provide support to Data Processing in the areas of MVS, Jes 2, on-line, TSO, program products, RJE, ITEL AS/6, 370/158 and other miscellaneous hardware and software. Actual experiance in generation or maintenance in some of these areas is desirable, but 1-3 years applications background with a strong desire to be involved with system software may qualify you for one of these positions.

**Send resume and salary history to Jerry Stenger.**

BECKMAN

**BECKMAN INSTRUMENTS, INC.
2500 North Harbor Boulevard
Fullerton, California 92634**
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# COMPUTER SCIENTISTS & SOFTWARE ENGINEERS

## WHO ARE WE?

One of the San Francisco Bay Area's fastest growing software systems developers wants you to consider the oppportunities that we have for exceptionally qualified software professionals like you.

## WHAT TECHNOLOGY ARE WE USING?

A strong program that blends IR&D, contracts and internal projects gives us the opportunity to participate in technological developments at the leading edge of software science. Our current high-technology contracts include:

- ★ secure operating systems development
- ★ distributed data -base studies
- ★ computer network architectures studies

Here are some of the areas which are particularly important to Western Development Laboratories.

**UNIX-based* Software Engineering**
- —PWB/UNIX
- —Development support systems
- —Software development tools
- —Specification languages

(*UNIX is a trademark of Bell Laboratories)

**Reliable Systems Technology**
- —Formal specification & program verification
- —Secure computer systems
- —Test and validation

**Distributed Systems Technology**
- —Data base management systems
- —Real-time data collection/synthesis
- —Local network architectures
- —Network protocols
- —1 to 200 MPBS bandwidth

**Operating Systems Architecture**
- —Capability-based systems
- —Network systems (micro, mini, midi, maxi)

## WHAT JOBS DO WE HAVE?

**Systems Development Programmer**
You will use modern systems programming languages running in PWB/UNIX environment to develop operating systems, software tools, DBM's, and network implementations. These positions provide excellent opportunities for technical growth.

**Operating System Designer**
You will draw upon your experience with several operating systems, your academic training, and your aiblity to conceptualize and communicate in order to design and specify a new class of operating system. You will learn to express your design in a formal specification language and to subject your specifications to rigorous analysis.

**Software Test Specialist**
You will break new ground in design of test methods for provably secure systems. Using your familiarity with modern software testing methodologies, you will interact with the systems design team. As a result, you will become familiar with formal mathematical specification techniques for software.

**Software Methodology Specialist**
You will work in a PWB/UNIX environment to create tools to make the software development process more exact and less error-prone. Yor major contribution will be the direction of research and development that leads to the next generation of software tools.

**Programming Language Specialist**
Your knowledge of modern compiler-building technology and formal languages will be used in the evaluation and development of systems programming languages for use in support of our reliable systems technology efforts.

**Computer Facility Manager**
Your experience in systems configuration, maintenance, and operations will be used as you manage the Software Engineering Laboratory that presently consists of two large PDP-11 configurations running PWB/UNIX.

**Software QA Specialists**
You will use your knowledge of MIL-S-52779 and modern software QA systems to develop and apply WDL-wide software QA methodologies. Knowledge of modern systems development practices and high level systems programming languages is also required.

### OPENINGS IN PALO ALTO & COLORADO SPRINGS

If you have a BS, MS, PhD or equivalent related experience in one or more of the technology areas we've discussed, we'd like to talk with you. At Western Development Laboratories you will receive the professional recognition you deserve, excellent compensation, and one of the best fringe-benefits packages in the industry.

## WHAT ARE YOU WAITING FOR?

Please send your resume and salary requirements to: Professional Employment, Dept. PF-110, 3939 Fabian Way, Palo Alto, CA 94303. Or call (415) 494-7400, ext. 6601 for immediate consideration. We are an equal opportunity employer, m/f. U.S. Citizenship Required for most positions.

Ford
**Ford Aerospace &**
**Communications Corporation**
Western Development Laboratories Division
3939 Fabian Way, Palo Alto, California 94303
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# HARDWARE-SOFTWARE PROFESSIONALS

## We're Expanding Our Development Team!

We are an advanced development engineering company dedicated to solving todays data problems. We are currently involved in development areas that include:

- High and low speed modems
- A complete family of multiplexers
- Data network diagnostic systems
- The full spectrum of data terminals

If you have hardware or software experience in any of the following areas . . .

- Microprocessor based systems development
- Data communications
- Digital signal processing
- Digital systems design
- Operating systems
- RSX 11M systems
- Adaptive equalizers
- Real-time software
- Operating systems development

. . . . . we can offer you the opportunities to expand your professional horizons. We have in-house custom LSI development capabilities and unbounded opportunities for all levels of engineering and software development people.

For immediate and confidential consideration call Rod Manning collect at (305) 592-5996, Monday through Friday, 9 a.m.-4 p.m. or

**SEND US YOUR RESUME**
**AND WE'LL SEND YOU OURS!**

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**Programmer anelysts, project leeders, systems progremmers, IBM, Honeywell end minis. Selaries to $40,000.**

No fees or contracts. Our client companies pay all expenses. Career consultation prior to any action. Over 1000 EDP positions represented netionwide.

**Send your current reeume** (or an old one with pencil update) together with salary history snd geographic preference in complete confidence to our suburban Philadelphia headquarters . . . or phone:

**Systems Personnel, Inc.**
Suite D-26
207 Fox Lane
Wallingford, PA 19086
215-565-2920

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A NATIONWIDE CAREER SERVICE

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# Computer Professionals

Deere & Compeny, a leading manufacturer of agricultural equipment, has openings for the following positions:

## SYSTEMS ANALYSTS

You must have a minimum of 2 years experience, including IMS, in an IBM environment, preferably in manufacturing areas. Responsibilities will be veried.

## PROGRAMMERS

Prefer a minimum of 2 years experience including IMS with IBM equipment plus a knowledge of one or more of the following languages: COBOL, PL1, and FORTRAN.

We offer qualified candidates excellent starting salaries and comprehensive company-paid benefits including paid relocation to Iowa. For consideration, direct your inquiry with salary history to:

**Ronald H. Like**
**Deere & Company**
**Moline, Illinois 61265**
***An Equal Opportunity Employer M/F***

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# Programmers, Analysts, Software Specialists

We are Specialists Too!

We can put you in touch with openings from coast to coast regardless of geographic preference. Contact the nearest NPA affiliate listed below for confidential service. All fees employer paid.

**COMPUTER CAREERS INC.**
4424 Montgomery (Ave.)
Suite 200
Bethesda, MD 20014
(301) 654-8225

**SUPERIOR RESOURCES**
18400 Ventura Blvd.
Suite 338
Encino (LA), CA 91436
(213) 986-4400

**BUTTERFIELD'S EMPLOYMENT SERVICE**
161 W. Wisconsin Ave.
Suite 289
Milwaukee, WI 53203
(414) 276-7800

**RIKER PERSONNEL**
8790 Purdue Road
Indianapolis, IN 46268
(317) 288-8811

**ANDERSON-TAYLOR**
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Exton, PA 19341
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OVERSEAS ADVENTURE $40K+

# IRAN

Applications programmer, Systems Enginear, H-6000 or L/66, GCOS/COBOL/GMAP IDS TPE/MULTICS, US firm hes 18-24 mo tours w/fam. Ex financial pkg in Tehran. Ski 1 hr fm office. Rush resume: Cybermetrics Corp., P.O. Box 579, McLeen, VA 22101. (703) 356-1997. Othar posi-tions avail.

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# DB/DC SPECIALISTS

New Eng. Corp. expanding use of DB-oriented distributive processing applicatione. IMS and T.P. Softwere bkgd. qualifiee for excellent growth oppty. Salary to $30,000. (Fee paid.) Contact Stan Durbas.

**ROBERT HALF**
**PERSONNEL AGENCIES**
111 Pearl St
Hartford, Conn. 06103
(203) 278-7170

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# SUNBELT

Our clients, Fortune 500 corps in the South & Southeast, seek experienced DP professionels for these rapidly expanding facilities. All fees paid by client cos, incl all interview & relocation expenses. Top benefits, modern facilities in low tax, low cost of living areas (Carolinas, Florida, Georgia, Texas, Virginia).

| | |
|---|---|
| Comm Systems Engr | $35K |
| Data Base Design | $33K |
| Sr Systems Analyst | $28K |
| Systems Programmers | $28K |
| Systems Analyst (APL) | $24K |
| Progremmer Analyst | $22K |

For more info on these & other EDP career opptys, contact David Miller, (703) 790-1335, or send resume in conf to:

**FOX-MORRIS**
Personnel Consultents
7921 Jones Branch Drive
McLeen, VA 22102
EDP SPECIALISTS

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# Software Engineers

Fischer & Porter, en expanding leader in the commercial process control industry, has several key positione available for talented software professionels to develop advanced digital systems with the essistance of modern software technology such es:

- **An Interactive, UNIX* based computer network**
- **High Level System Implementation Languages—PASCAL, C, FORTRAN**
- **Structured Analysis, Design and Programming**
- **A Virtual Terget Machine Environment—PDP-11, LSI-11, 8080**

To qualify you should have e technicel degree, preferably advanced, with experience in one of the following areas:

- **Distributed System Architecture**
- **Portable Operating Systems**
- **Interactive Graphics**
- **Compiler Design**
- **Data Base System Design**
- **Software Tools**

We can offer you an excellent salery, e complete benefit peckege, e highly professionel environment end en opportunity for technical career enrichment.

Our modern systems center ie surrounded by e number of attractive communities offering excellent schools, shopping end culturel activities, plus the edvantage of nationelly known resort arees such es the Pocono Mtns. end the New Jersey seashore, ell within e convenient drive.

To apply for one of these positions, or for further information:

**Call Collect**
**(215) 674-6022**
**Any Time Day or Night**

or send your resume to Mr. Tom Hainee, (Dept. C) FISCHER & PORTER CO., E. County Line Road, Warminster, Pa. 18974 An Equal Opportunity Employer

*UNIX is e trademark of Bell Laboratories

FISCHER & PORTER

GROWTH WITH A PURPOSE
*through worldwide excellence in instrumentation*

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# User Support For Scientific Programmers

The Engineering User Services Department of Hughes Corporate Data Processing hes en immediete opening for a scientific computing consultent.

Major responsibilities will consist of providing programming and debugging essistance to scientific computer users, conducting seminars end short courses in FORTRAN, TSO, JCL, and other progremming subjects. Other duties will include writing user documentation, perticipating in software product eveluetion, end software quelity assurence.

A Bachelor's Degree in methematics or releted science is mandatory. The quelified epplicant should have experience in FORTRAN, PL/1, TSO, end OS or VS JCL.

Good communication skills, and en ability to work well with people required. Teeching experience is highly desirable.

Please send resume to: Ground Systems Group, Employment, Dept. 63-CW, P.O. Box 3310, Fullterton, CA 92634.

**HUGHES**
HUGHES AIRCRAFT COMPANY

U.S. citizenship required
Equal opportunity M/F/HC employer

# THE LIFE STYLE YOU'VE BEEN SEEKING—

## UNIVAC 1100

- COBOL
- Data Base Management

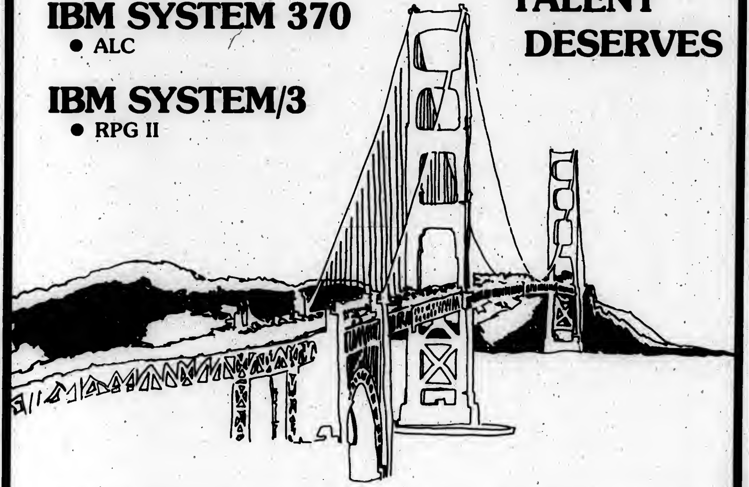
## IBM SYSTEM 370

- ALC

## IBM SYSTEM/3

- RPG II

## THE INCOME YOUR TALENT DESERVES



We are seeking Programmers/Analysts with 2 to more than 10 years' experience to design and develop business applications as well as the maintenance and enhancement of existing on-line systems.

Please call (415) 768-3196 (collect) or send resume in complete confidence to: Tom E. Lyon, Bechtel Corporation, Dept. 15-29-8, P.O. Box 3965, San Francisco, CA 94119.

***We've had 80 years of continued growth and success... become a part of it!***

an equal opportunity employer m/f

BECHTEL

# COMPUTER COMMUNICATIONS

Western Union, the recognized leader in the field of communications, has challenging opportunities on AUTODIN II and other worldwide and domestic computer communications networks.

## SYSTEMS ENGINEERING

Entry and Senior level positions. Analysis, design, specification, and evaluation of message and packet switched networks. Knowledge of minicomputers and programming languages desirable.

## COMMUNICATIONS SOFTWARE SPECIALIST

Senior level position for individual with experience in the area of network level protocols, and minicomputers or mainframe operating systems. Entails evaluation of subscriber requirements and the specification and implementation of the interfaces to computer networks.

## SYSTEM TESTING

Senior and Junior positions for individuals with software experience. Must be effective contributor in evaluating and establishing test methods and procedures to include automated testing concepts.

## SIMULATION

At least 3-5 years' experience in the area of computer network simulation and systems analysis. Development of static and dynamic communication system and computer performance models. Strong programming and mathematical background is required:

**Western Union will be recruiting at**
**the Hyatt Hotel during the**
**National Telecommunications Conference,**
**Birmingham, Alabama, December 3-8.**

Applicants should have at least a BS degree. An advanced degree in Operations Research, Computer Science or Electrical Engineering is desirable. Salaries will be commensurate with experience and education. Submit resume, in strict confidence, to: Mr. T.E. Simon, Director of Administration, Dept. CW 1120,

**Western Union**
**Government Systems Division**
**7916 Westpark Drive, McLean, Virginia 22102**
*An Equal Opportunity Employer M/F/Handicapped*

western union

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# DATA PROCESSING OPENINGS

### Mark IV

We are seeking two Mark IV programmer/analysts to become part of our new Task Team in Manchester, N.H. You must have 2 to 3 years experience as a Mark IV programmer/analyst in an insurance environment, with a solid knowledge of special features and experience with OS/VS1, VM/CMS, and IBM 370/158.

### Programmer/Analyst

You must have 3-5 years experience including 370 OS background, with insurance experience as a definite plus.

### Assistant Computer Support Services Analyst

Problem solving, communication skills and operations experience are required for results-oriented positions. Strong background in 370/158, OS/VS1, VM/CMS is preferred. Knowledge of Value Computing would be a plus, while knowledge of JCL is required.

American International Group Data Center is the data processing arm of one of the world's foremost insurance organizations currently doing business in over 130 countries around the world.

We offer excellent starting salaries, complete benefits package and the opportunity to work in the four seasons area of scenic New Hampshire only a short drive from metropolitan Boston.

Aggressive, knowledgeable persons wishing to excel in international and corporate data center environment who are seeking a progressional challenge in a growth oriented corporation are asked to submit their resumes to:

**Director of Personnel**
**American International**
**Group Data Center**
**1750 Elm Street**
**Manchester, N.H. 03107**
*An Equal Opportunity Employer M/F*

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EASTERN

# DATABASE DESIGN SPECIALIST

Eastern Airlines currently has a position available as a database administration specialist at its Miami base. This position is a key to planning our entry into a formal database environment and will participate in evaluation of database/data control software.

Applicants should have a college degree with extensive database design and administration experience in an online environment. IMS database design experience preferred. Exposure to other DB/DC software is a plus, particularly TOTAL-ENVIRON/1 and/or UNIVAC DMS.

At Eastern we offer a competitive salary, company paid family health benefits, liberal travel privileges and paid relocation expenses. Please send detailed resume including salary history to:

**Eastern Airlines**
**Personnel Office**
**Dept. C-1**
**Miami International Airport**
**Miami, Florida 33148**
*An Equal Opportunity Employer M/F*

---

PROGRAMMER/ANALYSTS

# Accepting the challenge is your job... Providing the challenge is ours.

Challenging opportunities are available for professional programmer/analysts with at least six months experience . . . we're growing to make room for you.

Please send resume to:

Joe Tirado
Spear Street Tower
1 Market Plaza, Suite 1018
San Francisco, CA 94105

or

Dan Grainger
500 E. Carson Plaza
Suite 224
Carson, CA 90746

or

Mike Odom
10300 N. Central Expwy
Building #1
Dallas, Texas 75231

**informatics inc**

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# EDP

## AS SPECIALISTS IN SYSTEMS AND TELECOMMUNICATIONS

we can offer
career opportunities
in the following areas:

- ✓ DIRECTOR MIS
- ✓ SYSTEMS & PROGRAMMING MANAGEMENT
- ✓ SYSTEMS PLANNING & ADMINISTRATION
- ✓ INTERNAL CONSULTING
- ✓ PROJECT MANAGEMENT
- ✓ QUALITY ASSURANCE
- ✓ EDP AUDIT

*call or send resume*
*stating area of interest*

**paul homer**
Personnel Agency Inc . EDP Professionals
521 Fifth Ave., N.Y., N.Y. 10017
(212)697-3300

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# B-6800

## Analyst/Programmer

**On-Line Data Base**
**Programming**
**For All Applications.**

Enjoy a challenging and rewarding position with a dynamic manufacturing organization in a highly desirable West Michigan resort community. Send resume and salary history in strict confidence to:

**Mr. Tom Lewis**
**JSJ Corp.**
**Box 687**
**Grand Haven, Mich. 49417**
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National Software Consulting Firm seeking Programmer/Analysts for their Mid-Atlantic clients with 2 to 10 years experience and at least two of the following technical requirements: COBOL, OS, JCL, CICS, MARK IV, TSO, IMS, BAL on IBM 370 or 360 hardware. Please submit resume and add a note with your salary requirement.

**ROBERT HALF**
**PERSONNEL AGENCIES, INC.**
217 The Quadrangle, Balt., Md.
21218 (301) 323-7770
7318 Wisconsin Ave., Wash.
D.C. 20814 (301) 652-1968

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# DATA PROCESSING

# CAREER OPPORTUNITIES

## Outstanding Opportunities For Career Growth in Corporate MIS

Champion International, a major forest products company, is experiencing continuing growth of our distributed processing systems and increased development of our large-scale computer projects. Our expansion in these areas has created many challenging and rewarding opportunities for Data Processing Professionals with college degrees or equivalent experience in the following areas:

### PROGRAMMERS & ANALYSTS

Positions require at least 2 to 7 years experience in business applications. ANS COBOL and OS JCL skills preferred, but not mandatory. Minicomputer experience a plus.

### OPERATIONS ANALYSTS

Positions require at least 2 to 5 years experience in applications or technical programming. IBM JCL skills are necessary. An interest in the technical side of data processing would be beneficial.

### STANDARDS SPECIALISTS

You must have good oral and written communication skills together with the ability to interact effectively with others. Responsibility will center on developing data processing standards and procedures for MIS department.

### MINICOMPUTER SOFTWARE PROGRAMMER

You will be involved in software development on IBM Series/1 minicomputer. Responsibility will be for writing software for our distributed processing systems.

### OS SYSTEMS PROGRAMMER — IBM S/370

Position requires 2 to 5 years systems programming experience. A background in performance measurement and telecommunications would be beneficial.

### SHIFT SUPERVISOR—COMPUTER OPERATIONS

Two years of college is preferred, together with a required 3 years experience in computer operations or a related data processing field, such as programming or systems; prior supervisory experience is beneficial. You will supervise the employees and operations of the computer center.

**In addition to an excellent working environment, we offer** competitive salaries commensurate with your education and experience, plus a generous fringe benefits program including company-paid medical and dental insurance and a non-contributory retirement program.

For immediate attention to these career-advancement opportunities, send resume with salary requirements in complete confidence to Mr. D.M. Yamasaki, Personnel Manager, Champion International Corporation, Knightsbridge Drive, Hamilton, Ohio 45020.

**Champion International Corporation**

We take affirmative action towards equal opportunity employment

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# DATA PROCESSING

## Director Data Processing

Dynamic San Francisco based leader in bank card processing has an immediate need for a director of Data Processing.

Responsibilities include co-ordinating the activities of computer operations and systems programming. Equipment configuration features an Amdahl V-6 and dual 370-158's. Successful candidate will possess proven management in a similar operation plus strong computer science knowledge. Background in telecommunications preferred.

We offer an excellent starting salary, a wide range of benefits and the opportunity to play an important role in our continued expansion process.

Please submit resume or letter of interest, including salary history, to: Duff Wenz:

Tymshare
Transaction
Services, Inc

**900 Front Street**
**San Francisco, CA 94111**
**(415) 393-0366**
*Equal Oppty. Employer m/f/h*

# OFFICE AUTOMATION SPECIALIST

New York-based "Fortune 50" company is seeking an Internal Consultant with expertise in office practices, procedures and automation. This newly created position will be on the corporate staff level with responsibilities to advise and assist operating units world-wide establish and maintain office technologies.

The requirements for this position include a thorough understanding of today's office operation and procedures coupled with in-depth technical knowledge of the state-of-the-art in office automation. Prior work history should include a minimum of 5 years experience in word processing equipment evaluation and selection, systems analysis and programming and familiarity with environmental conditions, facilities and management controls that permit office functions. Understanding of recent developments in the small computer field is desirable.

**Send resume including salary history in confidence to:**

**CW Box 1752**
**797 Washington St,**
**Newton, MA 02160**
*an equal opportunity employer*

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# CALIFORNIA

- **SANTA BARBARA**
  Sr. P/A needed for a 370 installation located in a beautiful Coastal community. OS COBOL required. Strong desire for POS or Telecommunications. Full relocation. to $22,000.
- **NORTHERN CALIF.**
  Electronics mfg needs a Mgr of Data Base Admin to be responsible for entire DBA dept. Excel relocation & benefits package. to $35,000.
- **CENTURY CITY**
  Major firm seeks Sr. P/A with knldg of COBOL to aide in implementation of a distributive network (IBM's 3790) for corp DP Center. Excel Co. to $20,000.
- **SOUTH BAY**
  Large corp seeks IMS & CAD/CAM analysts. Requires either engr'g or mfg applications exp. Work is in on-line & communication networking system. to $32,000.

**the jarvis walker group**

11222 S La Cienega Blvd., Inglewood, Ca 90304
(213) 670-7353

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# SYSTEMS ANALYST
## FOR PRIME COMPUTER

NUS is seeking a hard-working, self-motivated individual to assist in code conversion to the PRIME Computer, develop software packages as required, and maintain software. Bachelor's Degree or equivalent in Engineering, Physical Science or Computer Science required as well as experience in FORTRAN, COBOL, PRIME Computer, CDC Computer and IBM Computer. Several years experience in time sharing is mandatory. Send resume to:

**Personnel Administrator**
**Box HY**
**NUS CORPORATION**
**4 Research Place**
**Rockville, Maryland 20850**

*EOE*

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ats

# ATS IS OFFERING UNUSUAL OPPORTUNITIES FOR SOFTWARE (SYSTEMS & APPLICATION) PROFESSIONALS.

To Investigate Send Resume To:

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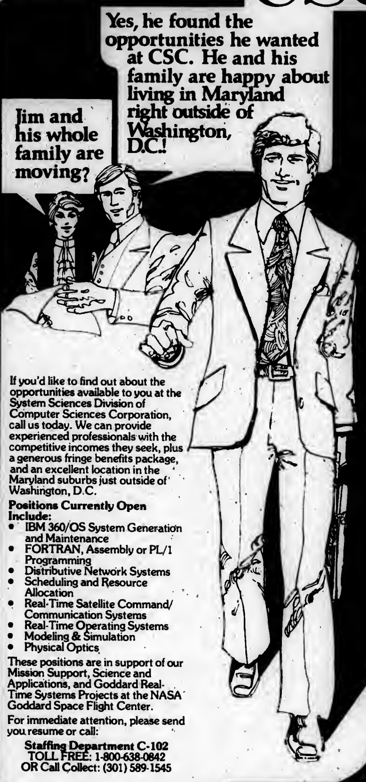
# PROGRAMMER/ANALYSTS

CSC


Yes, he found the opportunities he wanted at CSC. He and his family are happy about living in Maryland right outside of Washington, D.C.!
Jim and his whole family are moving?

If you'd like to find out about the opportunities available to you at the System Sciences Division of Computer Sciences Corporation, call us today. We can provide experienced professionals with the competitive incomes they seek, plus a generous fringe benefits package, and an excellent location in the Maryland suburbs just outside of Washington, D.C.

**Positions Currently Open Include:**

- IBM 360/OS System Generation and Maintenance
- FORTRAN, Assembly or PL/1 Programming
- Distributive Network Systems
- Scheduling and Resource Allocation
- Real-Time Satellite Command/Communication Systems
- Real-Time Operating Systems
- Modeling & Simulation
- Physical Optics

These positions are in support of our Mission Support, Science and Applications, and Goddard Real-Time Systems Projects at the NASA Goddard Space Flight Center.

For immediate attention, please send you resume or call:

**Staffing Department C-102**
TOLL FREE: 1-800-638-0842
OR Call Collect: (301) 589-1545

**COMPUTER SCIENCES CORPORATION**

**System Sciences Division**
**8728 Colesville Road**
**Silver Spring, MD 20910**

Major Offices And Facilities Throughout the World
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# Software Marketing

If you have a successful sales track record in the Data Processing Industry, preferably in software sales, the Cullinane Corporation would like to hear from you. The ideal candidate will also have a public accounting background and an advanced degree.

The Cullinane Corporation needs qualified Marketing Representatives to fill a number of positions that have been created through a major expansion of the Audit and Retrieval Systems Group.

Cullinane offers a very attractive compensation plan, a comprehensive benefits package, and opportunity for growth into sales and marketing management.

Applicants should send a detailed resume to Bob Wilbur, National Marketing Manager, Audit and Retrieval Systems Group, Cullinane Corporation, 20 William St., Wellesley, Massachusetts 02181.

We are an equal opportunity employer.

**Audit Software: Cullinane**

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## DATA PROCESSING

# SOLAR SAN DIEGO

offers the
Best of Southern California living
and the
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# MANUFACTURING SYSTEMS

For the results-oriented professional who possesses significant background in manufacturing systems, an exceptional career opportunity in state-of-the-art systems analysis can be found at SOLAR TURBINES INTERNATIONAL.

As a major operating group of a Fortune 500 company, Solar offers competitive salary, relocation assistance and an outstanding total benefits package.

## SR. SYSTEMS ANALYSTS

Requires several years experience in designing, programming and implementing manufacturing systems. This should include applications such as inventory control, shop order control, purchase order control, MRPS bill-of-material, standard cost, and capacity planning. Data base knowledge is desired.

Preferred is a degree plus familiarity with COBOL on a large scale IBM system.

## PROGRAMMER ANALYSTS

Requires at least 2 years of COBOL programming in a manufacturing environment with strong background in the design and implementation of data base systems.

If you have the expertise we seek, please send us your resume including salary history and expectations. Applications will be acknowledged.

CAROL DEARBORN

**SOLAR TURBINES INTERNATIONAL**

An operating group of International Harvester
2200 Pacific Highway, San Diego, CA 92138

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## ASSISTANT DP MANAGER

Central Illinois Bank, $281 million, seeks #2 man in EDP Department. Must be trained in systems design, programming and operation of IBM 360-370 computer, model 35 or larger. Minimum two years banking experience and supervisory background. Send resume to Personnel Department, First National Bank of Springfield, 5th & Adams, Springfield, IL 62701. An equal opportunity employer.

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**CALL FOR IMMEDIATE INTVW (212) 682-8600**

## CORP DIRECTOR MIS

Metro area, multi-division mfg corp of health prods needs strong mgr to direct hq & div level systems. Small to med scale systems, mfg & acctg pkgs. Low travel, reports to V.P. Finance. Salary low $30's. Immed intv.

## SR SYSTEMS CONSULTANT

N.J. corp hdqtrs has need for a sr level, mfg, EDP oriented individual. Responsibilities will be to develop and plan systems needs for multiplant environment. Degree and several years EDP req'd. This is a career oppty with one of N.J.'s leading corp. Salary range is at the $30K level.

**F–O–R–T–U–N–E**
**EDP Division**
**agency 505 5 Av, NYC 10017**

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## SYSTEMS PROGRAMMER

**BECOME INVOLVED IN THE MIGRATION OF A LARGE OS/HASP ENVIRONMENT TO IBM 3033's WITH MVS.**

Excellent opportunity for professional to participate in the planning, installation and support of 3033's using MVS. Additional responsibilities include support of current operating system and associated functions. Environment consists of multiple RJE batch and online locations both domestic and European countries. Experience with MVT, MVS or VS and BAL required. Knowledge of COBOL, Fortran, TSO Telecommunications or Data Base are additional assets

Send detailed resume and salary history in confidence to:

PERSONNEL MANAGER
DRESSER IND., INC.
EASTERN COMPUTER CTR.
810 PARISH ST.
PITTSBURGH, PA 15220

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## FLORIDA

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1311 N. Westshore Blvd.
P.O. Box 22851
Tampa, FL 33822
(813) 878-4181

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## PROGRAMMER ANALYST

We are a rapidly growing, major Bank Data Services Corporation located in Florida. We are seeking two technically qualified, highly motivated, Professionals to work in our IBM, DOS/VS environment. Bank applications should include Loans and/or Deposit Systems. These are career opportunities offering competitive salaries and an outstanding benefits package. Our employees know of this ad. Please submit resume complete with salary history, in confidence to:

CW Box 1784
797 Washington St.
Newton, Ma. 02160

*An Equal Opportunity Employer*

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## PROGRAMMER/ANALYSTS

Candidates must be familiar with structured programming and/or design techniques, as well as a variety of high level languages. We seek individuals who will maintain the currency of their knowledge of computer sciences while utilizing their excellent basic skills. Positions are available in all levels in both Montpelier, Vermont and Denver, Colorado.

## DATA BASE DESIGNER

We are seeking a versatile and creative individual to work on the design of a large, complex, integrated data base. Previous involvement with this type of design effort is required, as well as experience with a variety of DBMS protocols. Knowledge of data base structuring must be current and thorough. This position is in Denver, Colorado.

Our company is a well known leader in public policy analysis and research. We are currently engaged in several major projects, including the automation of public welfare administration in several states. Our approach is interactive, distributed, and includes an extremely flexible software design.

Candidates can expect salaries ranging from $17,000 to $30,000 and excellent advancement possibilities.

We will be holding interviews for qualified candidates during the week of the ACM Conference, Dec. 4-8, in Washington, D.C. Please call Pam Tarwater at (303) 837-1500 (collect) for an appointment.

If you are not going to be in Washington, D.C., please send your resume, salary history, and location preference to:

Placido Herrera
Mathematica Policy Research
1410 Grant St.
Denver, CO 80203

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# MINI/MICRO PROGRAMMERS

Hercules Incorporated of Salt Lake City, Utah has immediate openings for mini/micro programmers.

The successful candidate will develop, implement, and support automated real time application systems for data acquisition, data reduction and reporting. Efforts include problem definition, software design/development, and hardware interfacing. This position requires a technical BS degree and knowledge of structured design/programming desirable. We offer a comprehensive benefits program.

Work and live in Salt Lake City, the city known for its healthy family environment and outstanding cultural and recreational opportunities. The center of scenic America.

**Send resumes or call collect:**
**(801) 250-5911 Ext. 3493**
**P.O. Box 98, Magna, Utah 84044**

HERCULES
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*U.S. Citizenship Required*
*An Equal Opportunity Employer*

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# DIVISION D.P. REPRESENTATIVE

Philips Industries, Inc., with a headquarters in Dayton, Ohio is a manufacturer of quality products and components for the building industry. Sales this year exceeded $240 million. Our system provides information services for over 30 locations.

Working in a rapidly growing organization, you will report to the Corporate Manager of D.P., and work on-site at one of our operating divisions acting as liaison between the division and D.P. You will be responsible to work with the management of that division for a definition of business required to support them in the operation of their division. You will also be deeply involved in the analysis, design, and development of business systems with heavy emphasis on manufacturing.

Degree preferred or equivalent work experience with formal systems. Must have heavy D.P. programming and systems experience in manufacturing applications, such as MRP, Shop Scheduling, Cost Control, etc. Ability to perform technical systems design is a must, and experience with IMS data base preferred.

**FOR PROMPT ATTENTION**
**Please call collect or send resume to:**

**Bonnie Filoso**

**PHILIPS INDUSTRIES INC.**

4801 Springfield St.
Dayton, Ohio 45401
(513) 253-7171

*An Equal Opportunity Employer M/F*

CAREER OPPORTUNITY AT

**AVCO COMPUTER SERVICES**

Avco Computer Services, one of the largest and fastest growing New England based data centers, has a current requirement for a:

## MANAGER TECHNICAL SERVICES

We are seeking an individual with appropriate experience in a large data center environment to coordinate our System Support/User Support activity, direct the system performance evaluation program and supervise all tele-processing functions. This position is also responsible for hardware and software planning and installation.

Avco is a national supplier of large-scale computer services and supports a variety of customers throughout the United States.

Our present environment includes an IBM 370/158 AP, IBM 370/158 MP, running MVS/JES 2 Multi-Access Spool, RJE and TSO.

The successful candidate should have a minimum of 5 years supervisory background in a large data center environment with several years of IBM MVS/JES 2 experience. In addition to strong writing and verbal skills, an understanding of end-user requirements is essential.

Avco offers an excellent salary compensation plan and provides an opportunity for professional growth in a creative environment. Our benefit program includes full tuition reimbursement for advanced education.

*Forward your resume including salary requirements in confidence to:*
*Mr. Peter C. Dowd*
*Employment Supervisor*

**AVCO COMPUTER SERVICES**

201 LOWELL STREET
WILMINGTON MASSACHUSETTS 01887
*An Equal Opportunity Employer*

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# We Must Be Doing Something Right

In 1BB5, George Parker invented his first game in the basement of his Salem, Massachusetts home. We've been growing ever since. Today, we're a subsidiary of General Mills, and we are the second largest game manufacturer in the world. Parker Brothers is certainly doing something right.

Our continuous pursuit into new technologies has kept us growing, and will continue to do so. Recently we have entered the electronic game market providing new excitement within the company, and a chance for you to grow. Talk to us, it's the right thing to do.

## Manufacturing Systems Section Supervisor

Reporting to the Manager of Information Systems, this position will interface with all levels of management to identify and translate user requirements into systems specifications, and provide technical supervision to subordinates.

Qualifications include a Bachelor's degree, five years experience in design and analysis of manufacturing systems, and a working knowledge of COBOL.

## Programmer Analyst

An exciting opportunity exists for you to advance your career in the Financial Systems section of Parker Brothers. Here is a chance for you to utilize your talents in the analysis, design, and implementation of new systems, with some responsibility for existing systems. You will also be responsible for providing programming and analysis support, and for translating user requirements into defined business systems.

Two to five years of solid COBOL programming experience, preferably with a background in financial systems analysis, and the ability to communicate effectively is required. Analysis training and financial systems experience would be a plus.

*If you are interested in these exciting positions with the company that does things right, please send your resume to:*

**Michele Peluso**
**PARKER**
**BROTHERS**
**C11/20**
**50 Dunham Road**
**Beverly, MA 01915**

An Equal Opportunity
Employer M/F

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**PARKER BROTHERS**

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# PROGRAMMER/ ANALYST

The Anaconda Company is seeking an experienced scientific Programmer/Analyst to provide support for engineering and operations personnel involved in copper mining, milling, smelting and refining activities. Responsibilities include systems design, programming and supporting documentation. Applicants should have at least two years FORTRAN programming background and some experience in systems analysis and design. College degree in Physical Science and/or job related experience in mining industry preferred. Experience in COBOL, ASSEMBLER, IBM 370 computers, DOS/VS, CMS and statistical analysis would be an added plus.

In addition to an excellent salary and fringe benefit plan, this position will be located in beautiful South West Montana affording the successful candidate a small city environment with unlimited outdoor recreational opportunities. For immediate consideration please send your resume in confidence to: The Anaconda Company, Dept. GR, 555 17th Street, Denver, Colorado 80217. We are an equal opportunity employer m/f.

**ANACONDA**
A Subsidiary of Atlantic Richfield Company

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# HOW DID A COMPANY THIS DYNAMIC AND THIS BIG ESCAPE YOUR NOTICE?

Last year our earnings set an unprecedented seventh consecutive new high. We became the undisputed leader in our industry in 17 years because at Iowa Beef we spend money where it counts: for the best possible equipment and most highly qualified staff.

Our data processing system consists of Dual Honeywell 6600's operating under GCOS and IDS II. It extends through all areas of IBP's operations from basic financial systems to 4 process control operations which totally run our material handling systems. This department is expanding rapidly and right now we are seeking the following additions to staff:

## PROGRAMMER ANALYSTS

You should have at least 2 years of COBOL programming experience and at least 1 year of experience involving systems design with emphasis on team leadership responsibilities for the development of a major computer system.

## PROGRAMMERS

You must have a minimum of 2 years of COBOL experience working with large scale hardware.

Our programmers receive challenges tough enough to satisfy the most ambitious. In addition, we offer an excellent compensation/benefits program that includes an annual cash bonus and relocation allowance. For more information, please send your resume in confidence or call:

**Walt Macleg**
**(402) 494-2061**

**ibp IOWA BEEF PROCESSORS, INC.**

**P.O. Box 3350**
**Sioux City, IA 51101**
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engineering

**EMI**

# SOFTWARE ENGINEERS

As a leader in the field of computerized tomographic x-ray scanners, we currently have several positions available for Software Engineers with various levels of experience.

You should have a BSEE or Computer Science degree and at least one year of scientific programming using Fortran and assembly language on a mini-computer system. Our Systems require:

- Operating systems for instrument control.
- Machine-level programming of micro' computer circuitry.
- Algorithms for image processing.
- Software testing and distribution to field sites.

These positions involve continual challenge in a small project group environment and are accompanied by an excellent compensation and benefit package.

If you qualify, and are interested in further career development, send your resume (including salary data) or call Stevan Callisher at (312) 291-4434.

**EMI MEDICAL INC**

4000 Commercial Drive
Northbrook, ILL. 60062

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# SYSTEMS ANALYSTS DATA BASE DESIGN FORTRAN - COBOL

RED LOBSTER INNS, THE NATION'S LARGEST, FULL-SERVICE, SEAFOOD RESTAURANT CHAIN, HAS AN IMMEDIATE OPENING IN OUR 370/148 VM/CMS SHOP FOR A DP PROFESSIONAL WITH SUBSTANTIAL EXPERIENCE IN DATA BASE DESIGN AND SYSTEMS ANALYSIS IN A TIME-SHARING ENVIRONMENT.

WE OFFER:

- EXCELLENT SALARY AND BENEFITS
- PROFIT SHARING
- ORLANDO, FLORIDA LOCATION
- PAID RELOCATION

IF YOU QUALIFY, SEND YOUR RESUME WITH SALARY HISTORY TO DEPT. REG., RED LOBSTER INNS OF AMERICA, INC., P.O. BOX 13330, ORLANDO, FLORIDA 32859.

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# SAN FRANCISCO DP TRAINER POSITIONS

## BANK OF AMERICA HEADQUARTERS

In—house programming instructors needed for the following areas: COBOL, OS-370, ALC, STRUCTURED PROGRAMMING, DESIGN AND ANALYSIS.
Salary commensurate with experience. Send resume to:

Dept. 3411, P.O. Box 37000 San Francisco, CA 94137.
ATTN: B. Rowe

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**BANK OF AMERICA**

---

# COMPUTER SCIENCE DEPARTMENT

Permanent opening beginning Sept. 1979 at the instructor or assistant professor rank. Salary range: $11,937-$17,545. Duties include teaching beginning level and basic and upper level computer science courses in an applied computer science program and a background in Fortran and Cobol desired with some specialized experience. For instructor, Bachelor's in computer science or related field plus 15 graduate credits; for assistant professor, Master's in computer science or related field plus 10 graduate credits required. For instructor, three years of teaching and/or data processing experience; for assistant professor, four years of teaching and/or data processing experience required.

Please send applications to Gary L. Buterbaugh, Chairman, Computer Science Dept., Indiana University of Pennsylvania, Indiana, Pa. 15705, by Feb. 23, 1979.

*An Affirmative Action/Equal Opportunity Employer*

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# WARM AND SUNNY CENTRAL FLORIDA

Come and join a progressive county government in a rapidly growing area. The Polk County Information Systems Department is accepting applications for the following positions:

PROGRAMMER ANALYST I: Minimum of 2 years programming experience with team programming, writing user oriented programs, and familiarity with on-line systems $14,872 annually.

TECHNICAL SUPPORT PROGRAMMER/ANALYST: Minimum 2 years programming experience which includes a proficiency in programming in the following languages: COBOL, CICS and Assembler. $14,672 annually.

Applicants must be High School graduates with COBOL experience and preferably IBM training. Contact: Ms. Susanne Burley, Personnel Department, Board of County Commissioners, P.O. Box 60, Bartow, Florida 33830. (813) 533-1161, ext. 274.

*Equal Opportunity Employer M/F*

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# COMPUTER PROGRAMMER

Responsible and challenging position in a congenial educational environment to develop, maintain, and improve Administrative Systems and Programs. State-of-the-Art technology in Distributed Processing and On-Line Development utilizing both mini and large scale computers. Languages are COBOL, FORTRAN, and BASIC with plans for Data Base Systems. Benefits are superior and opportunity for advancement and personal growth is excellent. Requirements are a degree in Computer Sciences, Business Administration, or Mathematics, three years of intensive and progressive programming experience, advanced COBOL programming skills, ability to interface effectively with users and good written and oral communication.

Salary range is $13,000 - $17,500.

Send resume and inquiries to Carl Holloman, Director Computer Services, Jersey City State College 2039 Kennedy Blvd. Jersey City, New Jersey 07305. Telephone number (201) 547-3352.

*An Equal Opportunity Employer*

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### CONSULTANTS/ INSTRUCTORS NEEDED

Consultants and/or instructors whose expertise is in but not restricted to the following fields are invited to submit outlines for these topics: DATA BASE MANAGEMENT SYSTEMS • ON LINE PROCESSING SYSTEMS • COMPUTER MICROFORM • DATA PROCESSING MANAGEMENT • MINI COMPUTER EVALUATION AND SELECTION CRITERIA • DATA COMMUNICATIONS • ON LINE REAL TIME SYSTEMS DESIGN • MICRO PROCESSORS

We will require services for 2 to 3 day seminars given several times per year. Must be able to instruct at the highest level and communicate with experienced personnel in the field.

This is a unique opportunity for national and international recognition and compensation with a renown and prestigious sponsor.

For consideration please send a brief outline (2 to 3 pages) of each seminar you can teach plus a copy of your bio.

CW Box 1766
797 Washington St.
Newton, MA 02160

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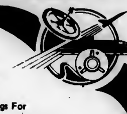

# AiResearch Manufacturing

Phoenix, Arizona
Has Immediate Openings For

- Sr. Systems Analysts
- Systems Analysts
- Project Managers
- Sr. Programmers

Plan and perform analysis of major company activities and guide the subsequent design and implementation of systems in a large highly technical manufacturing and engineering company. Knowledge of transaction processing, data base design and manufacturing, engineering and financial systems is desirable. Current equipment is a 370-158; software is OS/VS1, total data base management system environ/1 teleprocessing monitor.

Paid moving and travel allowance plus extra company benefits.

Send resume of experience to C.W. Tindell, Employment Administrator, AiResearch Manufacturing Company, 3151 E. Airlane, PO Box 5217, Phoenix, Arizona 85010.

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# INTERNATIONAL PROJECT TEAM

Ampex Corporation is creating an international project team to develop and provide data processing support for our worldwide marketing offices. We have immediate openings for:

## Project Senior Programmer/Analysts Programmer/Analysts

This team will be responsible for:

developing applications software for order processing, accounts receivable, accounts payable, inventory control and general ledger.

developing message switching software for European data communications network.

implementing these systems in our international subsidiaries.

Program development will be in BASIC on HP3000/III and the recently announced HP 300 systems.

If you are qualified for any of these positions, and enjoy international travel, please send a resume to C. Wright, Building 2, 2655 Bay Road, Redwood City, CA 94063. An affirmative action employer m/f.

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# OPERATING SYSTEMS MANAGER

You will be responsible for managing the activities of the Operating Systems Group involving, design, installation and maintenance of operating systems software and associated software for a large computer center (360/370) in a University environment. Will also be involved in preparing hardware/software justifications, recommendations, and evaluations.

Requires a minimum of 6 years experience with strong technical knowledge and good managerial/leadership skills in planning, directing and supporting systems software. Must be knowledgeable in the areas of OS/VS, Hasp, online and telecommunications systems.

Resume should be sent to Beverly Mace, University of Nebraska Computer Network, University of Nebraska at Omaha, Omaha, Nebraska 68182.

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## COMPUTER BASED EDUCATION AUTHOR /PROGRAMMER

**Ætna Life & Casualty** has an immediate opening for an experienced Computer Based Education Author/Programmer. Applicant should have 1–3 years experience developing Computer Assisted and/or Computer Managed Instruction Courses using either the PLATO TUTOR or Coursewriter III languages. Instructional design, multimedia program development, or experience in developing insurance Data Processing Educational Programs are a definite plus.

Full Company benefits.
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**$28,000 Range**

370/OS, IMS Environment

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For Confidential Consideration Forward Resume With Present Salary

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Qualifications: 3-5 years experience DOS Systems Programmer
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3-5 years experience Data Base Management
Exposure to OS
Hardware: IBM 370-155, 360-65, Honeywell Level 6 MINI

* Data Base System Support Programmer *

Qualifications: 2-3 years experience Data Base/
DOS Systems Programmer
Exposure to ENVIRON/1 and TOTAL is a plus
Hardware: IBM 370-155, 360-65, Honeywell Level 6 MINI

If you fit one of the two opportunities as listed, and if you are looking for a career opportunity with a Dynamic nationwide corporation providing data processing management services to the medical industry, AND if you want to relocate to a clean, family-oriented community with good schools and churches, but close to the big cities yet have immediate access to year-round vacation spots, then . . . please submit a resume and letter with your salary requirements to:

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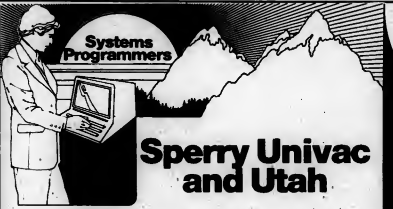

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Minimum 5 years EDP systems and programming experience in the wholesale distribution industry. Must be proficient with COBOL and thoroughly familiar with IBM 370 systems using DOS/VS, Power V/S, and CICS facilities. Working knowledge of assembler language a definite plus. Requires a minimum of 2 years systems design and analysis experience. Excellent opportunity to progress to project leader quickly. Multi-division, rapidly growing company with EDP development staff located at corporate headquarters in progressive Southwestern Ohio city. Salary range $16K to $22K.

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DMI, Inc., an expanding farm implement manufacturer located in Central Illinois, is looking for an innovative, shirt sleeve individual to direct the activities of it's Data Processing Department.

You will have overall responsibility for organizational structure, policy, goals, and objectives, as well as evaluation of the department.

We require a minimum of 10-15 years experience in systems design, COBOL, RPG, on line application in a manufacturing environment and previous administrative responsibility.

We offer excellent starting salary and fringe benefit package to the qualified individual.

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### To $30K—San Francisco

Our Bay Area client has 3 immediate openings for IMS Application Consultants. Positions require 5 years' experience in Data Processing with a minimum of 3 years' experience in architectural design, application program support, working with productivity aids, Data Base performance, tuning standards/procedures and exposure to internals. Relocation expenses will be paid and an excellent benefit package is included.

We are consultants to management. For immediate consideration, please send resume and salary history in confidence to **Gary R. Schultz, One Maritime Plaza—Suite 1350, San Francisco, California 94111. (415) 956-7120.** Employer assumes fee.

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## Head of Computer Center

Mississippi State University is seeking candidates for the position of Head of the Computer Center. Position responsibilities include management of a large-scale central computer, coordination with user personnel, leadership in systems development and long-range planning, supervision of approximately 35 employees, and the possibility of part-time teaching. Position also includes the possibility of academic appointment.

A large-scale Univac 1100 system provides computer support to teaching, research, service, and administrative data processing.

Applicants must meet the following requirements: doctorate in Computer Science or a related field; managerial, systems programming and/or programmer/analyst experience in large-scale computing; demonstrated state-of-the-art knowledge of computing.

Salary open. Send resume by February 1, 1979 to:

Dr. Fred Davis, Director
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Mississippi State University
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Rapidly growing $25 million turnkey systems company seeks individual to assume total responsibility for all software development and support activities.

Credentials should include significant background with a major vendor in application software development for multiple end-users. In addition to technical expertise, strong managerial and motivational skills are essential. In-depth exposure to PASCAL, PL-I or other high level languages a must.

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Applicant must have 2–5 years COBOL programming experience in OS/MVS, JCL, Dump Analysis with VM370 CMS or TSO knowledge or 3–5 years of Data Base experience with working knowledge of various DBMS'S (IMS, TOTAL, IDMS, ADABAS) and exposure to Data Base retrieval packages (ASI-ST/RAMIS). Must be capable of teaching technical data to both beginning and experienced personnel. Degree in education or prior teaching experience a plus.

Salary range is $16,000–$25,000 depending on experience.

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**205 665-2521 Ext. 438**

Submit resume to the Personnel Office #45 before Dec. 5, 1978

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COMPUTER ASSISTANCE, INC.
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203-233-9848

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## Miami Univ. Oxford, Ohio

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The Department of Systems Analysis has a minimum of two and up to four tenure track positions for an Assistant Professor. Teaching assignments will be primarily at the undergraduate level in computer languages such as COBOL, Assembler, FORTRAN, PL/1, RPG, and BASIC. In addition, the person may also be required to teach courses in operating systems, teleprocessing and data base management. Ph.D. in related areas or a Masters with substantial experience in systems is required. Send your application by February 15, 1979 to:

Amit K. Jain, Chairman
Systems Analysis Dept.
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Are you effective at measuring and evaluating system performance?

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**Please send your resume to:**

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## MANAGEMENT POSITION

### $23,500-$33,100

Manager, Payroll/Personnel System reports to the Assistant Vice President : Information Systems & Computing at Systemwide Administration (UCSA) of the Uiversity of California in Berkeley. UCSA is developing a new Payroll/Personnel system for use at all nine campuses. The three major phases to this project are substantial redesign of purchased vendor software in conjunction with the vendor within terms detailed in a contract; responsibility for installation at campuses including user training, manuals, and modification for various hardware configurations; and responsibility for ensuring that the new system interfaces with existing central and campus systems. The project is extremely large and complex and involves supervision of a professional staff of 11-15 persons, intensive interaction with campus technical, user, and management personnel, and a close working relationship with the vendor.

Qualifications: Demonstrated project management experience and a thorough working knowledge of AIS in general and payroll systems in a university environment in particular. Excellent oral and written communications skills and a full understanding of the complexities involved in a multi-campus university environment are essential. The ability to be firm and to effect cooperation is very important.

Closing Date: December 11, 1978. Send resumes, salary history and a letter stating your interest and objectives to Ms. Edna Coleman, Employment Representative, 734-IS&C University Hall, University of California, Berkeley, Calif. 94720. The University of California is an Equal Opportunity, Affirmative Action Employer.

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## Programmer Analyst

We seek a qualified individual to fill this key position in our Richmond headquarters. Will assist in the analysis, development and programming of computer systems on an IBM 370/135, DOS/VS. Prepare necessary systems and program documentation. Must be able to communicate effectively with users; and program proficiently in ANSI COBOL. BASIC and Teleprocessing a plus. Degree preferred with experience in programming and systems analysis.

**Liberal starting salary**
**Excellent benefits**

Reply in writing stating qualifications to
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Required experience includes e strong supervisory or management background in Process Control Systems utilizing mini computers. DEC PDP 11 is a plus but not mandatory.

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**DECEMBER — 1978**

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Salary subject to early modification from tha current collective bargaining negotiations. The salary range as of this date is $19,562.40 - $28,527.20, commensurate with qualifications and axperience.

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December 1, 1978

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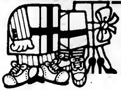

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## PROGRAMMER ANALYST

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The Department of Computer and Information Science at Cleveland State University has tenure track positions open at the Assistant and Associate Professor levels starting September 1979. Salary range is $18,000-$24,000 on a 9-month contract. Responsibilities include graduate and undergraduate teaching (two courses each quarter) and research participation. Applicants should have a doctorate in Computer Science or a closely related area. For the Associate level, significant industrial or university experience and evidence of scholarly research is required. Close relationships to Accounting, Finance, and other business departments provide good opportunities for those whose research and consulting interest are in applications of computer science to such areas. Joint programs with the Engineering, Mathematics, and the Sciences are also supported. Inquiries and current vita should be sent to: Dr. James O. Schoeffler, Chairperson, Department of Computer and Information Science, UC 574, Cleveland State University, Cleveland, Ohio 44115. (216) 687-4780. Equal Opportunity Employer M/F/H

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Nixdorf, a leading international supplier of Business Systems and Distributed Data Processing Products in the commercial market, seeks your participation in our exciting expansion of communications within our product lines.

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# IMS Internals Project Manager

**To 30K—Florida**

Our Florida client is seeking an IMS Internals Expert who is currently a manager or who has management potential. This position requires 6 years in Data Processing with 4 years IMS internals design, working with productivity aids, standards and procedures, performance timing and data base recovery techniques. Relocation expenses paid and an excellent benefit package is included.

We are consultants to management. For immediate and confidential consideration, please send resume and salary history to: **Gary R. Schultz, One Maritime Plaza—Suite 1350, San Francisco, California 94111. (415) 956-7120.** Employer assumes fee.

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## REOPENING POSITION FOR DIRECTOR OF COMPUTER SERVICES

Responsible for all instructional, research, and administrative computer services. Current environment includes IBM 370/135 with DOS/VS, and CICS, DEC PDP 11/70.

Minimum requirements are 6 to 8 years of demonstrated leadership in academic, research or high technology industrial setting. Considerable knowledge of current state-of-the-art hardware, software and telecommunications in a college or university (including a College of Medicine) is desirable.

Master's Degree is required; however, a Doctorate in Computer Science, Business Management, Mathematics or a related field is preferred.

Salary consistent with top level University administrative responsibilities.

Please send resume by December 15, 1978 to:

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## IMS Programmer/ Analysts $18 to $28K

### San Francisco

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DATA PROCESSING

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FLIGHT SYSTEMS, INC. is seeking personnel for the coming Canadair "Challenger" Program at Mojave, California. Immediate opening for persons who can program in FORTRAN with 8S or equivalent and the following qualifications:

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Excellent benefits, salary commensurate with experience.

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**Attn: Margo Thomson**

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**Manager of Computer Center**
Manage all phases of operations. Strong supervisory skills and experience in IBM DOS/COBOL required.

**Manager Systems Programming**
Manage, schedule and control Mini-computer business, Turnkey Systems application group.

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# SOUTH FLORIDA PROGRAMMING OPPORTUNITIES

Racal-Milgo, internationally recognized leader in the data communications field is growing. Due to record sales and continued product development, we have the following programming positions available.

## SYSTEMS SPECIALISTS

The individuals we are seeking should have 3-5 years systems analysis and programming experience with business applications, utilizing ANS/COBOL. Experience on UNIVAC 1100 series and degree preferred.

## SENIOR DATA BASE ANALYST/DESIGNER

Duties include analysis, design and development of data bases for both batch and on-line applications utilizing DMS 1100 DATA BASE MANAGEMENT SYSTEMS. You will also be responsible for training, consultation, performance measurement and optimization of data base designs.

## DATA BASE ANALYSTS

Duties include maintenance of data bases, loading/off loading, consulting users and some design of data base structures. Qualified candidates should have 1 to 3 years of experience with COBOL, DMS 1100 or a CODASYL standard data base management systems.

These positions offer competitive salaries and employee-oriented benefits package. For confidential consideration call Miles Johnson collect at (305) 592-5996, Monday through Friday, 9 a.m. to 4 p.m. or submit your resume in confidence to.

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RACAL

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## GEOGRAPHIC INFORMATION COORDINATOR

**Boise, Idaho Area**
**$15,538-$19,843**

Challenging opportunity for an experienced individual to analyze, coordinate, and develop a geographic data services program utilizing GBF DIME applications on IBM 370 or comparable hardware.

Individual will serve as liaison between long range planning agency and functional departments of State, County and local governments. Position also includes supervision of data services staff.

Minimum requirements include a Bachelor's Degree, preferably in Information Systems, Geographic Applications, Planning or other related fields and two (2) years experience with geographic data base systems and mainframe (IBM) experience.

Submit resume and salary history to: Andrea Fogleman, Personnel Office, Ada Planning Association, P.O. Box 500, Boise, Idaho 83701. (208) 384-4310.

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## SYSTEMS ENGINEERS (DATA COMM'S.)

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Systems Analyst — Cochise College in Douglas, Arizona is in need of a person to analyze and develop applications for a wide variety of business and educational uses. Bachelor's degree in business or computer science, five years experience, preferably in a college environment. Must possess the ability to communicate effectively with both computer systems practitioners and lay-users. Apply before December 1, 1978, to Personnel Office, Cochise College, Douglas, AZ 85607

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Programmer/Analyst with 5 years experience in banking, insurance and distribution business systems seeks a new position in New Jersey. Well-conversant with COBOL, BAL, PL/1 and JCL languages. Experience includes Amdahl 460/V6, IBM 370/168 and 3032 machines, MVS operating system, TSO/SPF, Panvalet, Improved Programming Technique. Presently employed by a big bank in Montreal, Canada and on the waiting list of U.S. Immigration visa. Interested party please write to:

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This position is for an individual with a Bachelor's Degree in a technical discipline, plus 3 to 5 years experience in using, designing or marketing computers. You should have current awareness of technology and industry trends, be able to write clearly and concisely and have good oral communication skills. Your responsibilities will include: developing concepts for processor products; coordination of product development; analysis of market trends; designing overall merchandising strategy. Position reports to the Product Manager.

SYSTEMS offers you a competitive salary, a full-range benefits program and the benefit of our Ft. Lauderdale, Florida location, which is a key area in the total world technical and computer community.

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Fast, accurate information is a vital management tool in today's highly competitive business environment. This is especially true in the sophisticated world of international telecommunications where RCA is a leader.

We are currently developing a new management information system to serve all facets of our business. Using state-of-the-art data base technology, the emphasis of the system will be on the timely provision of management information for planning and control purposes. The latest interactive techniques will be used.

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Applicants must be of the caliber to interface effectively with management users, and understand modern data base design and time sharing techniques. A college degree (preferably Masters) in computer science, mathematics, industrial engineering or related subjects and several years' systems analysis/design/COBOL programming experience is essential.

### Senior Programmer Analyst

A college degree in computer science, mathematics, industrial engineering, accounting/finance or related subjects is essential. Two years' COBOL programming experience and exposure to data base technology and time-sharing is desirable.

### Programmer/Analyst

To enhance and develop in-house systems in the areas of billing, finance, accounts reconciliation, general ledger, human resource, inventory control and market analysis.

Applicants, preferably with a college degree, must have a background in user interaction, problem definition and solving. Career development could be into data base activities. 3-7 years' experience in COBOL programming and Job Control Language associated with IBM 370 mid-range system using an operating system of Virtual Storage I is essential.

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You should have at least 5 years of DP experience with 3 years of systems analysis in either a manufacturing or distribution systems environment. Senior level manufacturing positions require solid knowledge of MRP, shop scheduling and cost accounting. The distribution analysts position requires experience in order entry, inventory control and physical distribution logistics. A technical background would be a plus.

To apply for these positions, please send your resume including salary history in confidence to Jerry Stenger.

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## SYSTEMS PROGRAMMERS

## FLORIDA

Florida's most prestigious communications company is looking for systems programmers to work on a communications project using DEC's new VAX11/780 computer.

Applicants must be familiar with PDP-11 assembly language, or similar, and have a solid background in real-time programming, preferably with a DEC operating system. Experience with modems and remote terminal handling would be an advantage.

The position offers a good salary, commensurate with experience, and excellent fringe benefits. Applications, including resume with full salary history, should be sent in confidence to:

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# Data Processing Professionals

VICTORIA STATION, a highly successful, rapidly growing full service restaurant company has immediate openings for experienced data processing professionals.

## Systems Analyst

Responsible for the definition and development of user department information needs leading to the general design of new or revised computerized systems. Background should include extensive experience in multiple application areas, including General Ledger, Payroll, Accounts Payable, Personnel, Fixed Assets and Cash Receipts. 8-10 years of data processing experience, at least 2 of which were as a systems analyst. Degree preferred.

## Programmer Analyst

Responsible for translating requirements defined by systems analysis and users into logical, economical and practical designs. This will include program design, coding, testing, implementation and documentation. Background should include extensive application experience, 2-3 years programming in RPG II; CCP experience a definite plus. College degree preferred.

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VICTORIA STATION

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GTE International has challenging 2 year assignment at new one-million-square-foot home entertainment products factory in Algeria. Fluency in French and English is desirable.

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## QUALIFICATIONS

- 5-7 years experience in data processing
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- Transportation background in marine or land a must.

Salary commensurate with experience plus yearly bonus and liberal benefits package. Send resume and salary history to:

Personnel Director
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**DESIGN ENGINEER**- Recent EE/Computer Science graduate or individuals with 2-3 years experience in minicomputer or microcomputer systems. You will design and implement complete I/O subsystems for use in Real-Time computer environments. Special emphasis is on Data Acquisition and control Peripherals. Data Translation offers a complete Health Insurance plan including Dental coverage. Salary 18K. Call or Send resume to:

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# PROGRAMMERS
### VM Systems Programmer

We are looking for a senior level person to be the chief designer of our MULTI-CPU VM SYSTEM. The design should cover the sharing of spool files and data between CPUs. Further, it should provide the framework for a multi-CPU "job" scheduling capability including selection, mountable device "set-up," and load balancing. Some other long range considerations are terminal load balancing and dynamic reconfiguration, dynamic CPU reconfiguration, and integrated systems status displays. Detailed internal knowledge of VM required. The ability to conceptualize and create a detailed design is required.

If you live outside the area, moving and reassignment expenses will be reimbursed within university limits. Vacation is accrued on a monthly basis; 3 weeks: first year; 4 weeks accrual begins at start of second year. Join in the exciting cultural and social environment of one of the world's outstanding universities where we continue to go beyond the state-of-the-art.

Please send resume and salary history to;

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Stanford Center
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# Programmers

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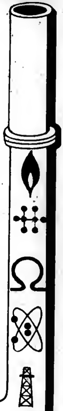

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Data Processing

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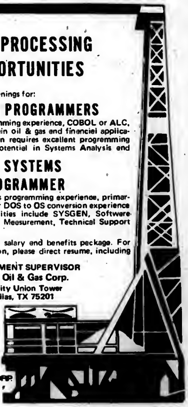

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data processing

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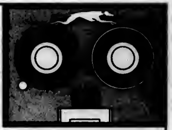

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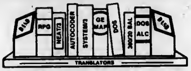

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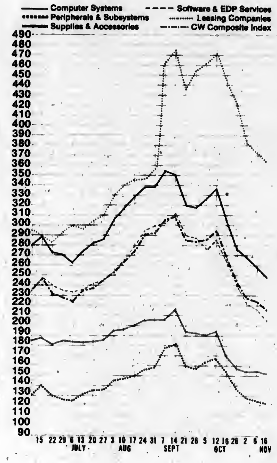

# Earnings Reports

**DATA TERMINAL SYSTEMS**
Three Months Ended July 31

| | 1978 | 1977 |
|---|---|---|
| Shr Ernd | $.72 | e$.33 |
| Revenue | 17,235,902 | 8,810,350 |
| Earnings | 3,390,610 | 1,550,987 |
| 6 Mo Shr | 1.21 | e.64 |
| Revenue | 30,844,462 | 17,678,679 |
| Earnings | 5,898,199 | 2,536,130 |

e-Adjusted for three-for-one stock split paid in January 1978

**HARRIS**
Year Ended June 30

| | 1978 | 1977 |
|---|---|---|
| Shr Ernd | $4.06 | $3.12 |
| Revenue | 872,249,000 | 646,266,000 |
| Earnings | 52,169,000 | 40,069,000 |
| 3 Mo Shr | 1.19 | .98 |
| Revenue | 254,377,000 | 198,610,000 |
| Earnings | 15,479,000 | 12,487,000 |

**HEWLETT-PACKARD**
Three Months Ended July 31

| | 1978<br>(000) | 1977<br>(000) |
|---|---|---|
| Shr Ernd | $1.14 | $1.07 |
| Revenue | 428,100 | 341,000 |
| Earnings | 33,200 | 30,500 |
| 9 Mo Shr | 3.31 | 3.13 |
| Revenue | 1,211,500 | 980,900 |
| Earnings | 101,400 | 88,700 |

**MOHAWK DATA SCIENCES**
Three Months Ended July 31

| | 1978 | 1977 |
|---|---|---|
| Shr Ernd | $.24 | $.25 |
| Revenue | 41,444,000 | 35,916,000 |
| Spec Cred | | e721,000 |
| Earnings | 1,861,000 | 1,692,000 |

e-Mainly from repurchases of debt

**TELE-COMMUNICATIONS**
Three Months Ended June 30

| | 1978 | 1977 |
|---|---|---|
| Shr Ernd. | $.15 | $.06 |
| Revenue | 16,212,000 | 12,820,000 |
| aSpec Cred | 578,000 | 284,000 |
| Earnings | 1,488,000 | 423,000 |
| 6 Mo Shr | .44 | .11 |
| Revenue | 30,116,000 | 25,509,000 |
| aSpec Cred | 960,000 | 610,000 |
| Earnings | 2,632,000 | 794,000 |

a-Tax-loss carryforward

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TRADE QUOTES

# Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, NOVEMBER 13, 1978

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

### COMPUTER SYSTEMS

| EXCH | | PRICE 1978 RANGE (1) | CLOSE NOV 13 1978 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|
| A | AMDAHL CORP | 28- 69 | 42 3/8 | -2 3/8 | -3.2 |
| N | BURROUGHS CORP | 59- 87 | 70 | -2 1/8 | -2.9 |
| O | COMPUTER AUTOMATION | 15- 44 | 17 | 0 | 0.0 |
| N | CONTROL DATA CORP | 23- 44 | 29 1/2 | -2 1/4 | -7.0 |
| O | CRAY RESEARCH INC | 21- 74 | 23 1/2 | -2 1/2 | -9.6 |
| N | DATA GENERAL CORP | 42- 71 | 33 1/8 | - 1/4 | -0.4 |
| N | DATAPOINT CORP | 34- 73 | 33 | -2 1/2 | -4.3 |
| N | DIGITAL EQUIPMENT | 39- 54 | 46 3/8 | -1 1/8 | -2.3 |
| N | ELECTRONIC ASSOC. | 2- 13 | 6 1/2 | - 3/8 | -8.7 |
| A | ELECTRONIC ENGINEER. | 9- 19 | 10 3/8 | + 3/8 | +3.7 |
| N | FOUR-PHASE SYSTEMS | 19- 48 | 23 | -2 3/8 | -8.6 |
| N | FOXBORO | 28- 40 | 31 | 0 | 0.0 |
| O | GENERAL AUTOMATION | 7- 26 | 12 1/2 | -1 | -7.4 |
| O | GRI COMPUTER CORP | 1- 3 | 1 | 0 | 0.0 |
| N | HEWLETT-PACKARD CO | 62- 93 | 78 7/8 | - 3/8 | -0.7 |
| N | HONEYWELL INC | 43- 72 | 61 | - 1/2 | -0.8 |
| N | IBM | 236-303 | 238 1/2 | -7 3/8 | -2.7 |
| O | MANAGEMENT ASSIST | 9- 29 | 13 3/8 | -1 5/8 | -9.3 |
| O | MANUFACTURING DATA S | 9- 23 | 17 | - 3/8 | -3.3 |
| O | MICRODATA CORP | 10- 23 | 13 1/2 | -1 1/2 | -8.8 |
| O | MINI-COMPUTER SYST | 4- 8 | 4 1/4 | - 1/2 | -10.3 |
| O | MODULAR COMPUTER SYS | 7- 17 | 7 1/2 | -1 | -11.7 |
| N | NCR | 37- 67 | 57 1/8 | -2 | -3.3 |
| N | PRIME COMPUTER INC | 20- 43 | 26 | -2 1/4 | -7.9 |
| N | PERKIN-ELMER | 17- 28 | 23 7/8 | + 3/8 | +1.3 |
| N | SPERRY RAND | 33- 49 | 40 3/4 | -1 1/4 | -2.9 |
| A | SYSTEMS ENG. LABS | 11- 24 | 12 1/2 | -1 3/8 | -9.9 |
| O | TANDEM COMPUTERS INC | 13- 37 | 24 3/4 | - 3/4 | -2.9 |
| A | WANG LABS. | 12- 32 | 20 | -1 | -4.7 |

### LEASING COMPANIES

| EXCH | | PRICE 1978 RANGE (1) | CLOSE NOV 13 1978 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|
| C | BOOTHE COURIER CORP | 15- 21 | 17 1/4 | + 1/4 | +1.4 |
| O | COMDISCO INC | 5- 22 | 12 3/4 | -1 1/4 | -8.9 |
| A | COMMERCE GROUP CORP | 1- 1 | 3/8 | 0 | 0.0 |
| A | COMPUTER INVSTRS GRP | 1- 7 | 3 1/2 | + 1/8 | +3.7 |
| O | CONTINENTAL INFO SYS | 5- 13 | 6 1/4 | 0 | 0.0 |
| M | DATRONIC RENTAL | 1- 3 | 2 3/8 | 0 | 0.0 |
| A | DCL INC | 3- 3 | 3 1/8 | - 1/8 | -3.8 |
| N | DPF INC | 8- 14 | 9 1/8 | -1 | -9.8 |
| N | ITEL | 16- 36 | 21 3/8 | -3 3/8 | -13.6 |
| N | LEASCO CORP | 24- 36 | 31 7/8 | - 1/8 | -0.3 |
| O | LEASPAC CORP | 1- 4 | 2 1/2 | 0 | 0.0 |
| A | PIONEER TEX CORP | 3- 7 | 3 3/8 | - 1/8 | -3.3 |
| N | U.S. LEASING | 13- 20 | 13 7/8 | + 3/8 | +2.7 |

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
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### SOFTWARE & EDP SERVICES

| EXCH | | PRICE 1978 RANGE (1) | CLOSE NOV 13 1978 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|
| O | ADVANCED COMP TECH | 1- 2 | 1 | 0 | 0.0 |
| O | ANACOMP INC | 8- 22 | 10 3/4 | -1 3/8 | -13.1 |
| A | APPLIED DATA RES. | 8- 17 | 9 | - 3/8 | -6.4 |
| N | AUTOMATIC DATA PROC | 24- 34 | 30 | + 7/8 | +3.0 |
| O | COLEMAN AMERICAN COS | 1- 2 | 1 | 0 | 0.0 |
| O | COMPU-SERV NETWORK | 6- 12 | 6 1/4 | + 1/4 | +4.1 |
| O | COMPUTER HORIZONS | 1- 9 | 3 1/2 | - 1/4 | -4.3 |
| O | COMPUTER NETWORK | 6- 16 | 6 1/2 | -1 | -13.3 |
| N | COMPUTER SCIENCES | 8- 17 | 9 3/8 | - 7/8 | -8.3 |
| O | COMPUTER TASK GROUP | 1- 4 | 3 3/4 | 0 | 0.0 |
| O | COMPUTER USAGE | 2- 4 | 2 1/8 | - 3/8 | -15.0 |
| O | COMPUT AUTO REP SVC | 4- 10 | 3 3/8 | - 1/8 | -2.1 |
| O | COMSHARE | 6- 19 | 12 1/2 | -1 1/4 | -9.0 |
| O | CULLINANE CORP | 14- 33 | 14 3/4 | -2 | -11.9 |
| O | DATA DIMENSIONS INC | 4- 9 | 4 1/4 | - 3/4 | -13.0 |
| O | DATATAB | 1- 2 | 1 | 0 | 0.0 |
| N | ELECTRONIC DATA SYS. | 15- 23 | 18 | + 1/4 | +1.4 |
| O | INSYTE CORP | 1- 3 | 1 | 0 | 0.0 |
| O | IPI COMPUTER MARKET. | 2- 3 | 3 1/4 | + 1/4 | +8.3 |
| O | KEANE ASSOCIATES | 3- 6 | 4 1/4 | - 3/4 | -13.0 |
| O | KEYDATA CORP | 1- 3 | 1 3/4 | - 1/8 | -6.6 |
| A | LOGICON | 10- 19 | 10 1/4 | - 1/4 | -2.3 |
| A | NATIONAL CSS INC | 15- 36 | 22 7/8 | + 1/4 | +1.1 |
| O | NATIONAL DATA CORP | 7- 13 | 8 | + 1/8 | +1.5 |
| A | ON LINE SYSTEMS INC | 12- 30 | 13 3/4 | -4 | -22.3 |
| N | PLANNING RESEARCH | 4- 10 | 3 3/4 | - 1/2 | -8.0 |
| O | PROGRAMMING & SYS | 1- 1 | 1 1/4 | - 1/8 | -9.0 |
| O | RAPIDATA INC | 3- 7 | 4 | - 1/2 | -11.1 |
| O | REYNOLDS & REYNOLD | 18- 34 | 26 1/2 | - 3/4 | -2.7 |
| O | SCIENTIFIC COMPUTERS | 3- 9 | 3 1/2 | - 1/4 | -4.3 |
| O | TYMSHARE INC | 18- 33 | 23 | - 1/2 | -2.1 |
| A | URS SYSTEMS | 5- 8 | 3 7/8 | - 1/8 | -2.0 |
| N | WYLY CORP | 1- 7 | 3 3/4 | 0 | 0.0 |

### PERIPHERALS & SUBSYSTEMS

| EXCH | | PRICE 1978 RANGE (1) | CLOSE NOV 13 1978 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|
| N | ADDRESSOGRAPH-MULT | 14- 32 | 20 1/4 | - 3/8 | -1.8 |
| O | ADVANCED MEMORY SYS | 7- 18 | 10 3/8 | -1 3/8 | -11.4 |
| N | AMPEX CORP | 10- 19 | 13 | + 3/8 | +2.9 |
| O | ANDERSON JACOBSON | 5- 10 | 3 1/4 | + 1/8 | +2.4 |
| N | APPLIED DIG DATA SYS. | 9- 22 | 9 | -1 | -10.0 |
| O | BEEHIVE INT'L | 3- 7 | 2 3/4 | - 3/4 | -21.4 |
| A | BOLT,BERANEK & NEW | 6- 14 | 9 1/4 | - 1/4 | -2.4 |
| N | BUNKER-RAMO | 10- 20 | 12 1/8 | - 3/8 | -3.0 |
| A | CALCOMP | 3- 13 | 4 7/8 | + 7/8 | +14.5 |
| O | CAMBRIDGE MEMORIES | 3- 9 | 3 3/8 | - 1/2 | -12.1 |
| N | CENTRONICS DATA COMP | 16- 37 | 24 1/8 | - 7/8 | -3.3 |
| O | COGNITRONICS | 1- 4 | 1 1/2 | + 1/4 | +20.0 |
| O | COMPUTER COMMUN. | 6- 12 | 3 7/8 | -1 3/8 | -29.5 |
| O | COMPUTER CONSOLES | 4- 10 | 4 | - 1/2 | -7.4 |
| A | COMPUTER EQUIPMENT | 3- 6 | 3 3/4 | - 3/8 | -9.0 |
| O | COMPUTER TRANSCEIVER | 1- 3 | 3 | + 3/8 | +14.2 |
| O | COMPUTERVISION CORP | 9- 30 | 21 1/4 | + 1/2 | +2.4 |
| O | COMTEN | 9- 30 | 24 1/2 | +1 | +4.2 |
| N | CONRAC CORP | 14- 24 | 13 1/2 | - 3/8 | -2.7 |
| O | DATA ACCESS SYSTEMS | 3- 14 | 12 3/4 | - 1/4 | -1.9 |
| O | DATA 100 | 9- 20 | 19 3/8 | + 1/8 | +0.6 |
| A | DATA PRODUCTS CORP | 14- 23 | 14 1/4 | -1 1/8 | -7.3 |
| O | DATUM INC | 2- 6 | 2 3/8 | - 1/4 | -8.6 |
| O | DECISION DATA COMPUT | 2- 4 | 2 3/4 | + 1/4 | +10.0 |
| O | DELTA DATA SYSTEMS | 1- 1 | 1 5/8 | 0 | 0.0 |
| A | DOCUMATION INC | 6- 34 | 17 3/8 | -2 1/8 | -10.7 |
| O | DATARAM CORP | 6- 32 | 20 | - 1/2 | -2.4 |
| N | ELECTRONIC M & M | 4- 9 | 4 1/4 | - 1/8 | -2.8 |
| O | FABRI-TEK | 1- 2 | 1 1/8 | 0 | 0.0 |
| O | GENERAL COMPUTER SYS | 1- 3 | 1 3/8 | 0 | 0.0 |
| O | GENERAL DATACOMM IND | 9- 21 | 10 1/2 | 0 | 0.0 |
| N | HAZELTINE CORP | 10- 17 | 10 3/8 | - 7/8 | -7.7 |
| N | HARRIS CORP | 17- 36 | 29 1/4 | -1 3/8 | -4.4 |
| O | INFOREX INC | 6- 11 | 6 1/2 | + 1/4 | +4.0 |
| O | INFORMATION INTL INC | 7- 12 | 7 1/4 | 0 | 0.0 |
| O | INFOTON | 0- 0 | 2 1/4 | - 1/4 | -10.0 |
| O | INTEL CORP | 39- 42 | 46 | -2 | -4.1 |
| A | LUNDY ELECTRONICS | 4- 8 | 4 3/8 | - 1/4 | -3.1 |
| O | MSI DATA CORP | 10- 19 | 11 3/8 | + 3/8 | +3.4 |
| N | MEMOREX | 27- 39 | 27 7/8 | -2 3/4 | -8.9 |
| M | MOHAWK DATA SCI | 6- 13 | 7 3/8 | - 3/8 | -4.8 |
| O | ONEX | 2- 4 | 3 1/2 | 0 | 0.0 |
| O | PENRIL CORP | 5- 12 | 9 1/8 | - 1/2 | -5.1 |
| N | PERTEC CORP | 9- 17 | 10 3/4 | - 3/8 | -3.3 |
| A | POTTER INSTRUMENT | 2- 2 | 1 3/4 | 0 | 0.0 |
| O | QUANTOR CORP | 2- 3 | 2 3/8 | 0 | 0.0 |
| O | RECOGNITION EQUIP | 7- 13 | 7 7/8 | - 3/8 | -7.3 |
| O | SCAN DATA | 1- 3 | 2 | - 1/4 | -11.1 |
| N | STORAGE TECHNOLOGY | 19- 46 | 23 3/8 | - 3/4 | -3.0 |
| O | T BAR INC | 11- 20 | 13 1/2 | -1 3/4 | -11.4 |
| O | TALLY CORP. | 4- 9 | 4 3/4 | +1 3/8 | +23.3 |
| A | TEC INC | 6- 13 | 4 1/2 | - 1/2 | -7.1 |
| N | TEKTRONIX INC | 33- 30 | 42 | - 1/2 | -1.1 |
| N | TELEX | 3- 9 | 4 3/4 | - 3/8 | -7.3 |
| O | TESDATA SYSTEMS CP | 9- 23 | 9 3/4 | 0 | 0.0 |
| O | WILTEK INC | 1- 2 | 1 1/8 | 0 | 0.0 |

### SUPPLIES & ACCESSORIES

| EXCH | | PRICE 1978 RANGE (1) | CLOSE NOV 13 1978 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|
| A | AMERICAN BUS PRODS | 6- 11 | 8 | - 1/4 | -3.0 |
| O | BALTIMORE BUS FORMS | 2- 4 | 1 | 0 | 0.0 |
| A | BARRY WRIGHT | 14- 30 | 20 | -2 | -9.0 |
| O | CYBERMATICS INC | 1- 1 | 3/8 | 0 | 0.0 |
| O | DUPLEX PRODUCTS INC | 13- 30 | 13 1/2 | + 1/2 | +3.3 |
| N | ENNIS BUS. FORMS | 8- 17 | 10 7/8 | - 5/8 | -3.4 |
| N | 3M COMPANY | 43- 66 | 38 | -1 3/8 | -2.7 |
| C | MOORE CORP LTD | 26- 34 | 28 1/2 | - 1/2 | -1.7 |
| N | NASHUA CORP | 18- 37 | 22 3/8 | - 3/8 | -1.6 |
| O | STANDARD REGISTER | 20- 27 | 21 1/2 | + 1/4 | +1.1 |
| A | TAB PRODUCTS CO | 8- 14 | 9 1/2 | 0 | 0.0 |
| N | UARCO | 19- 40 | 38 3/8 | - 3/8 | -0.9 |
| A | WABASH MAGNETICS | 10- 22 | 13 1/2 | -1 | -6.8 |
| N | WALLACE BUS FORMS | 18- 33 | 21 3/4 | -1 1/8 | -4.9 |

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